WAIKATO – AUCKLAND PASSENGER RAIL SERVICE

Preliminary Business Case

FINAL REPORT

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Report to Environment Waikato

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Waikato – Auckland Passenger Rail Service: Preliminary Business Case

Executive Summary

Environment Waikato ("EW") has for some time been investigating the possibility of establishing a commuter train between Hamilton and Auckland. The purpose of this report is to advance previous work to see if there is a preliminary business case for such a service.

The basic proposal is to operate a train from Hamilton around 6-6:30 am, arriving in Auckland 2 hours later, and returning from Auckland about 5:30 pm. The exact times have not yet been determined, and will need to be negotiated with ARTA, Ontrack, and Kiwirail. The train would only make limited stops to ensure a time competitive with car travel.. The proposal is to "start small", and require no capital expenditure on stations; hence it will use the current Hamilton (Frankton) station, and only stop at Huntly in the Waikato. In Auckland stops are planned at Newmarket and Britomart, and at Papatoetoe to connect with the new airport - Manukau bus.

Starting small also means not investing in purpose-built rolling stock. Kiwirail have offered to operate the service on their licence using their *Silver Fern* railcars . Their offer is to run it on a gross contract basis, with revenue (and revenue risk) accruing to EW. Their proposal is to start running the train in July. Their indicative price is $1.84m per year for one round trip per day on weekdays.

The potential patronage for the service has been assessed by studying commuter data from the 2006 census, and relating that to the patronage of the 2000-2001 train and a similar long distance operation, the *Capital Connection.* The total patronage from Hamilton is estimated at 128 journeys per day (64 each way), and from Huntly 16, making a total of 144. A single *Silver Fern* will offer 96 seats in each direction, so these numbers represent a load factor of 75%. All these figures are on a central scenario. High and low scenarios are also presented in the report.

Adding further stops in the Waikato or Franklin would add patronage, but require expenditure and slow the journey.

Potential fare levels are assessed in relation to current train and coach fares, and the ARTA commuter fares from Pukekohe. An average fare of $24 from Hamilton to Auckland has been assumed, along with $17.60 from Huntly (both including GST).

The revenue from the train depends on which stations are served, and more particularly, how many. Revenue from Hamilton and Huntly is assumed in the report, totalling $840,000 (including GST) per year on the central patronage estimate and using services through Newmarket. If services through Newmarket are not possible because of capacity issues, then a service along the waterfront route from Westfield to Britomart may be an alternative. This would attract less custom, and the revenue is expected to be about 15% less if this route is used. Any reduction in revenue will increase the shortfall requiring funding.

Overall, revenue would cover about 40% of the costs in the first year, improving with growth to about 68% in 2023, reasonable figures for suburban trains in this country.

Overall, the benefit (net revenue): cost ratio would be about 0.5. The proposal will have an operating deficit of $1.14m in the first year, lowering with patronage growth to $610,000 by 2023. The “funding gap”, an annualized measure of the deficit, would be -$6.6m NPV over the 15 year evaluation period.

The project is also analysed in economic terms, taking into account benefits to users and to non-users (such as congestion relief). Total benefits over 15 years amount to $15.5m, giving net benefits of $7.2m. Thus the project delivers more benefits than it costs, and the economic benefit: cost ratio is 1.9, comfortably in excess of 1. Including stops at other stations would put the ratio over 2. There is thus a reasonable economic case for the project.

On the high scenario, the proposal would have a BCR of 2.4, and on the low scenario, it would be 0.8 (both based on Hamilton and Huntly stops, via Newmarket).

A key factor in being able to run the train is access to track and stations in Auckland. ARTA’s view is that they will use all the available peak paths into Britomart by early next year, and that there is no room for a Waikato train in the peak hours. The issue is especially critical in their view around Otahuhu and Newmarket- Britomart. This issue will need to be negotiated with them, Ontrack, and Kiwirail passenger. Access to Britomart will have to be negotiated as well.

On the basis of rail services in Auckland and Wellington, the train would qualify for 60% funding from NZTA of the net costs (after revenue), or $648,000; the balance of $456,000 needs to come from Waikato sources. To qualify for NZTA funding, the train must be in the National Land Transport Programme, and to get into that it must be in the Regional Land Transport Programme. At this stage it is in neither programme. There is an opportunity to include it in the Waikato Programme as a result of hearings on the plan. Even if it is included in the programme, there is no guarantee it will get funded, given the competing priorities for the money available for the NLTP. On the other hand, the amount involved is small in relation to the total transport spending in the region, and as well in relation to public transport spending.

Even if the proposal can make it into the RLTP, raising the local share on short notice could be difficult. Kiwirail have indicated that if the service cannot start in July there is a very real risk that the *Silver Fern* vehicles will be reallocated to some other task.

Going forward, work could be undertaken on further stations to stop at in the Waikato, possibly including new stations altogether, and also investigating starting the train further south or east. Redevelopment of existing station facilities could be considered. Further daily trips using the same vehicle are also possible.

To get the project off the ground, further work is required to refine the timetable and the patronage, revenue, and cost estimates, and to negotiate access. As well, there needs to be dialogue with Kiwirail about the consequences of not starting in July, and how they might be mitigated.

The report concludes that the service could be established as soon as July, and has benefits comfortably in excess of costs. Funding needs to be developed to meet the opportunity, and negotiations on outstanding issues need to get underway.

Waikato – Auckland Passenger Rail Service: Preliminary Business Case

1. Introduction

Environment Waikato ("EW") has for some time been investigating the possibility of a commuter train between Hamilton and Auckland, and has commissioned reports on it. The purpose of this report is to advance previous work to the point of developing a business case and seeing if the train could be viable, with subsidy, and how fundable that subsidy would be. It was intended to be a preliminary look at the business case, to see if it was worth putting further resources into finalising it and organising the actual operation of the train. An offer by Kiwirail to run the train from July 2009 has given an opportunity to bring forward the actual operation.

The proposal is to run a morning and evening commuter train, arriving Auckland between 8 and 8:30 am, and returning from Auckland at about 5:30 pm. The journey will take 2 hours. The preferred route into Auckland is via Newmarket, so that it can tap into the market for travel to that point. There are capacity issues at Britomart associated with that route, so options being considered are using the waterfront route to Britomart, or even terminating at Newmarket. En route the train would call at at least one Waikato station and one south Auckland station (to allow transfers to suburban trains).

There is a particular issue that has to be resolved before the service as described in this paper can start. ARTA have a new timetable change planned for June this year, and again early next year, with increased train numbers. In their view, there are no available paths for a Hamilton train through Newmarket or into Britomart. On the other hand, Ontrack believe that enhancements to trackwork and signalling will permit enough paths for the demand, including a Hamilton train, when they are commissioned by mid 2010. The issue may simply be one of timing, and mean the train might initially have to take a different route to the desired one; or it may mean that the train simply cannot run in the peak times. There are formal channels to resolve this issue, and they need to be followed, as well as ARTA , EW, and Kiwirail (Ontrack and Kiwrail Passenger) meeting on the issue.

2. Strategic Context

The proposal to run a train fits well in a strategic context. When the Auckland Regional Transport Authority ("ARTA") in 2005 published its long-term vision for rapid transit in Auckland, it included regular passenger trains as far south as Hamilton.[1] EW itself is developing a rail strategy that includes improving passenger rail services.

The New Zealand Transport Strategy ("NZTS") published in 2008 has several strategies that the train would promote, including ensuring environmental sustainability, assisting economic development, assisting safety and personal security, improving access and mobility, and protecting and promoting public health. It helps these strategies by reducing car use, and so reducing fuel use, pollution, health issues, and road deaths and injuries, and as well reducing congestion in Auckland and improving access to it for Waikato people at peak times. The strategy

[1] ARTA, *High Quality Rail Rapid Transit for Auckland*, August 2005, p 5

specifically calls for a significant increase in the use of public transport and increasing its share of trips made.

The strategies in the NZ Energy and NZ Energy Efficiency and Conservation Strategy complement the NZTS strategies, particularly the promotion of public transport as an alternative to car use. The Energy Efficiency Strategy notes "significant scope" to move to long distance passenger rail.

In a recent paper,[2] Boulter and Wignall called for a more strategic assessment of the role of passenger trains, taking into account factors like the long-term closer integration of the Auckland and Hamilton economies, and the need to plan for the transport implications of that. They also noted the significant environmental advantages that rail had, but observed that long distance passenger trains were typically evaluated in narrow financial terms. In this report, the evaluation is based on the Land Transport Management Act criteria and NZ Transport Agency methodology, which do take a wider economic view.

The current government has expressed support for suburban rail services, and as well for infrastructure that advances its economic development priority. Nevertheless, the proposal will need to take its place in the queue for funding with other transport projects, both regionally and nationally.

3. Past and Present Trains

From 1991 to 2001 NZ Rail Ltd, later Tranz Rail, operated trains between Auckland and Rotorua and Tauranga. Initially they offered a service to Auckland in the morning and back in the late afternoon, but not at commuter times. Later the services commenced from Auckland in the morning and returned in the evening. The rolling stock used was the *Silver Fern* railcars.

Currently a similar service from Auckland to Hamilton in the morning, and vice versa in the evening, is provided by the *Overlander* Auckland – Wellington daytime train. During the summer this service is daily, but in winter it is a Friday-Sunday only train. Until 2004 an overnight train ran on the same route, enabling Hamilton – Auckland travel in the early morning and the reverse in the evening, though not at convenient commuter times.

From June 2000 to October 2001 the same *Silver Fern* railcars operated a commuter service from Hamilton to Auckland in the morning and return in the evening, integrated with the Rotorua and Tauranga services. This was operated as a commercial service, without subsidy, but was loss making. It carried up to 50 Hamilton – Auckland passengers daily, and an average of 31, but most of its demand came from Pukekohe and Papakura.

In 2001, Tranz Rail said it was unable to continue the service without subsidy, and the proposed new owner of the long distance passenger trains was not interested either in operating an unsubsidised service. The required subsidy was of the order of $400,000 p.a. At the time, there was no subsidy available, so the service was discontinued. The vehicles were then leased by ARTA to run Pukekohe services.

[2] R Boulter and D Wignall, *Identifying the Value of Long Distance Rail Services – Current Issues in Transport Assessment and Evaluation*, 2008. See www.vtpi.org.

4. Recent Reports on a Waikato – Auckland Train

(a) The Paling Report

In July 2006 Richard Paling and Ross Rutherford wrote the "Hamilton – Auckland Commuter Rail Feasibility Study" (the "Paling Report"), for Environment Waikato and the Hamilton City Council.

The report identified that a daily commuter service was potentially operationally feasible. It envisaged a locomotive-hauled train departing Hamilton in the early morning and returning in the evening peak, in a similar manner to the *Capital Connection* between Palmerston North and Wellington. It would start at Kahikitea Drive, to the south of the existing Hamilton station, and serve 8 intermediate stations en route to Britomart, via Newmarket. Half of these were to be within the ARTA region. Tuakau and Pokeno were not included, although their potential was noted.

The proposed train used locomotive hauled stock. The report proposed a two-locomotive train, one at either end, to allow for service to locations which did not permit one locomotive to change ends. In effect, this was to allow service to Kahikatea Drive and Britomart. It proposed the train be provided for both ARTA and EW passengers, and that the costs be shared between those bodies, with a 40/60 split between ARTA and Waikato.

To be attractive to long distance passengers, the rolling stock was to be of high quality, with toilets, on board refreshment facilities, and power outlets for laptops. It would be necessary to buy new cars (or ex British Rail refurbished cars) for the service. The SW cars for the Wairarapa trains were a likely model.

The overall proposal was estimated to cost $10.4m in capital, $4.4m for rolling stock and $6.0m for stations. Operating costs were estimated at $1.4m per year. Demand from within the Waikato (transport) region was estimated at 58-105 people (one way), with the central estimate at 89. Further patronage was likely from within Franklin District. The funding gap for the proposal was $11.7m in NPV terms, and the proposal had a BCR of 1.0. Using only existing stations substantially reduced the costs, taking the funding gap down to $7-8m, and improving the BCR to 1.3.

The report noted a proposal for a Rotorua group to introduce a train to Auckland. This would run at times outside the commuter times, and as such would be complementary to the proposed Waikato train. While it is understood that the Rotorua proposals are still actively being pursued (the group recently sought advice on the costs of reopening the Rotorua line), this report does not discuss them further.

(b) The Waikato Regional Rail Discussion Paper

In 2008 EW commissioned a Regional Rail Discussion Paper from Murray King & Francis Small Consultancy Ltd. This paper revisited the Paling Report. It noted that locomotive hauled trains involved high costs from the need to provide a locomotive at each end. Moreover, there were no spare cars available in NZ, so cars would have to be built new or rebuilt from imported second-hand cars. Extending an ARTA train would still require additional cars, and increase ARTA's cost by running its cars south of Pukekohe. An extended ARTA train would have the advantage of an existing slot at Britomart, but the platform length at Britomart was likely to limit train length, to a 6-

car train that would all be required for ARTA passengers. On this basis, a dedicated Waikato train with no ARTA component was the likely option.

The Discussion Paper looked for other options. It identified self contained diesel multiple units, which typically have driving positions at both ends, as a better option. The *Silver Fern* railcars were such vehicles, and would be suitable for use on the Hamilton route, with some refurbishment. They ran the original service to Auckland until 2001. They were owned now by Kiwirail, and are currently under contract with ARTA which uses them to run some of the Pukekohe services. The contract now (after a short extension) runs out in June 2009 and the cars are available after that. The region made its interest in them known to Kiwirail in 2008, so its potential use could be taken into account when Kiwirail was developing plans for their use.

The Discussion Paper noted that the *Silver Fern* railcars would be ideal for use in starting such a service. Each two-car unit could carry 96 passengers seated, so the service could start without over-providing capacity. They would be available relatively quickly after their use in Auckland ends. The railcars would need to be refurbished but a brief tidy up could see one of them in service while a second had a more thorough overhaul. That cost of that overhaul at the time of the Discussion Paper was estimated at about $1.8m/unit. They have toilets and a servery capacity, but no disabled access.

While one two-car unit would handle the load predicted in the Paling report, the Discussion Paper felt it would be prudent to have two for reliability and to cover maintenance periods. It is likely that patronage will be higher at some times and on some days, such as Friday (southbound) and two units could be useful for that. The railcars could run in multiple as one train. If the service grew, a third car could be available, or then it would be appropriate to consider investing in locomotive hauled carriages.

The Discussion Paper also discussed options for routing the train in Auckland, and alternatives to terminating at Britomart, and stations en route that might be served. It advocated starting small, so using existing facilities was recommended, in particular the existing Fraser St passenger station at Hamilton. A station at The Base could be considered once patronage had established. Other potential stations en route were identified. Since that report, the issues of stations en route and serving Britomart have been worked on further, and the position is updated later in this report.

The report concluded that the region should consider the following policies and actions with respect to the passenger train to Auckland:

Policies

- Start small: patronage can be established with minimum expenditure.
- Consider expressing an interest in using the *Silver Fern* railcars when no longer needed by ARTA.
- Negotiate with ARTA and ONTRACK for Britomart access, morning and afternoon.

Actions

- Confirm availability of paths south of Westfield (where there is a potentially dense train service; see below)
- Survey market about other destinations, such as Newmarket.
- Develop staged plan for stations in Hamilton.
- Monitor Government policy changes re long distance rail.

5. The Current Proposal

It has been established that the operation of a Hamilton – Auckland commuter train is technically feasible, although some details remain to be concluded, including track access. It is proposed that one *Silver Fern* railcar be used to establish the service. Kiwirail have proposed using a car that is currently having an interior and structural refurbishment in Wellington, which will be available immediately after the completion of the refurbishment. Kiwirail confirm that the other cars are available once the ARTA contract ceases at the end of June 2009. If the refurbishment has not been completed, an unrefurbished car can be used in the meantime.

Kiwirail is actively seeking a use for the cars as soon as possible after that date, so there is pressure on a decision to use them for the Hamilton service from July, which in itself creates funding issues for the region. Kiwirail is firm that the cars have alternative uses, but they may be willing to negotiate a later start in return for some compensation, if they could be sure the service would run.

The proposal is to run a service that suits commuters and those with business meetings in Auckland, timed to arrive in Auckland preferably between 0800 and 0830. The trip will take about 2 hours, depending on the number of stops, so the departure from Hamilton would be between 0600 and 0630. The return service is likely to leave at about 5:30pm. The *Silver Fern* cars are permitted to run at a maximum speed 10% faster than locomotive hauled trains. The previous *Waikato Connection* was timed to leave Hamilton at 6:15 and arrive at Auckland at 8:11am, and return leaving Auckland at 5:19pm, arriving at Hamilton at 7:13 pm.

The exact timetable has not yet been determined, and the final timetable will inevitably involve a trade-off between the need to have a departure time at a sociable hour, while delivering people to Auckland in time for work. Interaction with other trains in the Auckland area especially will also have an impact on the timetable. As well, these timings will need to be negotiated in the context of ARTA's requirements. Britomart terminal is at its busiest from 7:30 am and 8:20 am, and from 5:10 pm to 6:10 pm. A timetable that avoids those hours might have the best chance of getting access to Britomart.

As noted below, Kiwirail have in fact offered an indicative price for the service. To that extent, progress has moved beyond the initial aim of establishing a draft business case, although there are still details to resolve. As the train would be a Kiwirail train, run under its licence, the issues of multiple operators previously raised are no longer relevant.

6. Patronage Estimates

(a) Introduction

Patronage forecasts have been re-estimated by Richard Paling. The forecasts of the potential traffic likely to use a new commuter rail service connecting Hamilton and Auckland made in the Paling report were based on data from the 2001 Census, supported by information on the *Capital Connection* currently operating between Palmerston North and Wellington, and the operations of the Waikato Connection in the early part of this century. In developing the forecasts for rail usage an

assessment was made of the growth of the total numbers commuting between Hamilton and Auckland after 2001.

Information from the 2006 Census has now become available. This has two main applications, the updating of the numbers commuting between Hamilton and Auckland and also information on the numbers using rail to commute into Auckland from locations such as Papakura and Pukekohe, which can be used as the basis for forecasts for services from Hamilton.

(b) Changes in the Numbers Commuting between Hamilton and Auckland between 2001 and 2006

The growth in the numbers commuting between Hamilton and other points along the railway line to the north and Auckland between 2001 and 2006 is set out in Table 6.1.

Table 6.1
Numbers Commuting into Auckland City and The Auckland Region 2001 and 2006
(journeys per day)

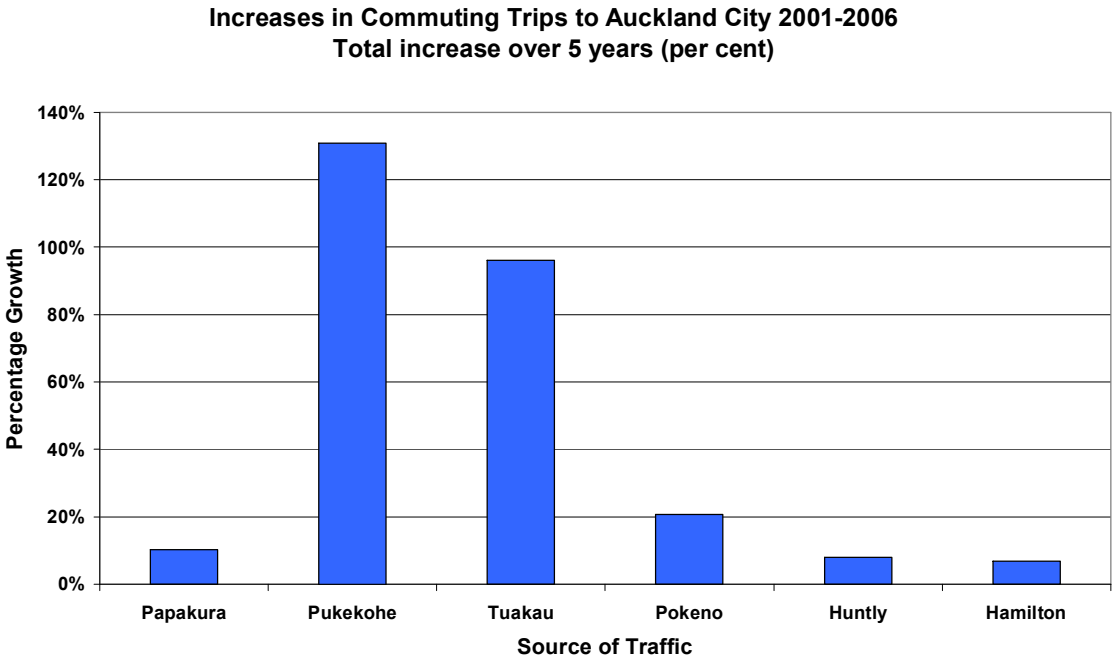
Source of Traffic	Year	Destination of traffic	
		Auckland City	Total Auckland Region
Hamilton	2001	311	588
	2006	332	656
	Growth	7%	11%
Ngaruawahia	2001	15	33
	2006	18	36
	Growth	20%	9%
Huntly	2001	38	111
	2006	41	125
	Growth	8%	12%
Te Kauwhata	2001	18	60
	2006	27	69
	Growth	50%	15%
Pokeno	2001	87	243
	2006	105	306
	Growth	21%	26%
Tuakau	2001	78	264
	2006	153	462
	Growth	96%	75%
Pukekohe Centre (1)	*2001*	*261*	*807*
	2006	*720*	*2133*
Growth		*176%*	*164%*
Pukekohe Surrounds (2)	*2001*	*117*	*336*
	2006	*153*	*423*
	Growth	*31%*	*26%*
Total Pukekohe (3)	2001	378	1143
	2006	873	2556
	Growth	131%	124%
Papakura	2001	3528	14904
	2006	3891	16182
	Growth	10%	9%

Notes (1) Includes Census Area Units of Pukekohe North, Pukekohe West and Bledisloe Park
(2) Includes Census Area Units of Paerata-Cape Hill, Eden Road-Hill Top and Buckland
(3) Combination of Pukekohe Centre and Pukekohe Surrounds

For trips originating in Hamilton, the growth of the numbers commuting northwards into Auckland City, the prime market for any new rail services, over the 5 years from 2001 to 2006 has been very limited with an increase of about 7 per cent. For the Auckland region as a whole the growth has again been fairly modest at about 11 per cent.

At this stage no assessment has been made of the potential ridership from locations south of Hamilton. It is likely that any patronage for a commuter service would be very small either because of the length of journey to Auckland, probably significantly in excess of 2 hours, or because of the very early arrival time in Hamilton (at about 6.30am). This could be reviewed in the light of different service timings if these are judged appropriate for the main route between Hamilton and Auckland.

For areas closer to Auckland, there has been more substantial growth, reflecting the greater proximity to the larger number of employment opportunities further north. This is set out in Figure 6.1:



Notes : This graph excludes the position for Ngaruawahia and Te Kauwhata where the numbers are small and given the rounding processes adopted by Statistics NZ, the estimates of growth may be unreliable.

Figure 6.1 illustrates the high growth rate in commuting trips into Auckland City from Pukekohe on the fringe of the region, and the subsequent decline in the growth rate for areas further south as the distance from Auckland increases.

The growth rate for commuting trips from Hamilton to Auckland at 7 per cent in total over the 5 year period from 2001 to 2006 was below the rate of growth of employment in Auckland City as a whole, which amounted to about 15 per cent, and is significantly below that anticipated in the 2006 Paling Report. This report forecast growth of almost 8 per cent per year based on the growth rates in Hamilton-Auckland City commuting experienced over the previous 10 years.

The reason for the relatively low growth experienced over the period may in part be due to conditions on the Waikato Expressway which was in the process of being

upgraded in 2006 with the consequent disruption of traffic flows and increased journey times and journey time unreliability. This would have made commuting a less attractive option.

The lower growth may also reflect increases in employment opportunities within Hamilton itself with the expansion of economic activity in and around the city. Growth in employment in Hamilton City and the Waikato Region in general was substantially higher than population growth. As a result, more job opportunities would have been available to Hamilton and Waikato residents so reducing the need to travel outside the region to gain employment.

(c) Use of Rail for Travel to Work in 2006

The information from the 2006 Census also indicates the numbers of commuting journeys which were undertaken by rail and this is summarised in Table 6.2:

Table 6.2
Proportions of Commuting Traffic by Rail 2006

Source of Traffic		Traffic Destination		
		To Waitakere City	Auckland City	Manukau City
Papakura District	Total Jobs	81	3891	5079
	Per cent by train	0.0%	10.6%	1.4%
Pukekohe Centre (1)	Total Jobs	21	720	828
	Per cent by train	0.0%	7.1%	0.7%
Pukekohe Surrounds (1)	Total Jobs	3	153	159
	Per cent by train	0.0%	5.9%	0.0%
Total Pukekohe (1)	Total Jobs	24	873	987
	Per cent by train	0.0%	6.9%	0.6%
Tuakau	Total Jobs	9	153	171
	Per cent by train	0.0%	2.0%	1.8%
Pokeno	Total Jobs	3	105	129
	Per cent by train	0.0%	5.7%	0.0%

Notes (1) See notes to Table 6.1

The dominant destination for train users is Auckland City and the numbers using rail for journeys to work in Waitakere and Manukau are typically relatively small.

The proportions commuting by train into Auckland City, the major destination, are highest for Papakura and then decline for locations further south, falling to about 7 per cent of the total for Pukekohe and 2-6 per cent for Tuakau and Pokeno. In part this probably reflects the quality of the rail service, with train frequencies being relatively high to Papakura and lower to Pukekohe.

For Tuakau and Pokeno, another leg would be required for the journey to give access to the railway. For Pokeno the main point of access to the rail network is likely to be at Papakura. This would make use of the relatively easy route via SH1 to connect with rail at a location where frequencies are relatively high and the service attractive, giving a high propensity to use rail. For Tuakau the main access is probably via Pukekohe where a less frequent service is operated, resulting in a lower propensity to use rail.

For the purposes of estimating the potential demand from locations between Pukekohe and Hamilton, it has been assumed that rail travel would account for the

same proportion of commuting journeys to Auckland City as is currently recorded for Pukekohe, at about 6.9 per cent of the total. This may represent a fairly optimistic position, since the proposed frequency of service would be lower and the rail journey considerably longer. To offset this, no allowance has been made for journeys to Manukau City but as Table 6.2 demonstrates the numbers of these are likely to be very low.

(d) Non-Commuting Trips

In addition it is likely that commuting would only account for a proportion of the journeys using the new service. Surveys undertaken in 2001 on the Capital Connection suggested that only 31 per cent of the journeys from Palmerston North to Wellington were for commuting and information from ARC counts in 1992 indicated that commuting only accounted for 40 per cent of the total number of car journeys from the Waikato to the Auckland region. The figure of 40 per cent has been used for the central forecasts.

(e) Forecasts for 2009.

The information from the Census relates to 2006. For the 2009 forecasts it has been assumed that forecasts based on 2006 figures would grow by about 4 per cent per year, midway between the growth in commuting between Hamilton and Auckland experienced for the period from 1991 to 2001 and that experienced in the subsequent 5 years. This assumes some acceleration from the relatively low growth experienced over the last 5 years.

A set of low, central and high forecasts has been produced. The low forecasts assume a lower share for rail trips of 5 per cent compared to 6.9 per cent in the central and high forecasts and the high forecasts assume that commuting trips make up 31 per cent of the total compared to 40 per cent in the low and central forecasts.

The forecasts which result for 2009 are set out in Table 6.3.

Table 6.3
Revised Patronage Forecasts
Total Journeys per Average Weekday

Between Auckland and:-	Scenario		
	Central	Low	High
Hamilton	128	75	165
Ngaruawahia	7	4	9
Huntly	16	9	20
Te Kauwhata	10	6	13
Pokeno	41	24	52
Tuakau	58	34	75
Total	260	151	335
Total excluding Tuakau and Pokeno	161	94	208
Hamilton and Huntly only	144	84	185

These are generally slightly lower than those produced in the 2006 Paling report, reflecting the additional information which has now become available.

(f) Qualifications to the Forecasts

As far as possible the forecasts have been made using observed data for travel between the Waikato and Auckland in 2006 and 2009, or where this is not available, base data for other areas or years has been used. In using this data to predict the likely patronage of rail services between Hamilton and Auckland, it has been assumed that an attractive service can be offered in terms of elapsed travel times and reliability, on-train conditions and the timing of the journeys. In this regard, the refurbished *Silver Fern* car proposed by Kiwirail has tray tables at the seats, similar to airline seats, and power outlets for laptop computers. In addition it has been assumed that the proposed fares which are largely based on those of alternative modes within the corridor would again be attractive to users.

The current forecasts are substantially higher than the flows achieved by the Waikato Connection in 2000-2001. In part this reflects an assumed growth in the market for travel between Hamilton and Auckland between 2001 and 2009, increased congestion on the motorway network in Auckland and a general greater enthusiasm for rail travel. This has resulted in high growth in rail trips to Auckland by Pukekohe residents and by growth in rail travel in the Auckland Region from just over 2 million trips per year in 2001 to 7 million per year in 2008. The forecast increase over the flows achieved earlier is underlain by the assumption that the service provided will be of a high quality and will be attractive to both commuters and those travelling for other purposes.

The forecasts in table 6.3 assume a route via Newmarket.

(g) Public feedback

At a public meeting held in Hamilton on 16 April 2009, several speakers indicated their personal support for a train service to Auckland. These were from Hamilton and intermediate points, notably Huntly. They fell into two groups, people who lived in the Waikato and were employed in Auckland; and those who lived in the Waikato and worked there, but who frequently travelled to Auckland for meetings, or for onward air travel. For both groups, the current mode was by car, with some air travel. Coach was not seen as an option.

The advantages seen for a rail service were the avoidance of congestion in Auckland, and therefore a quicker journey; the ability to make productive time of the journey by reading, computer work, or preparation for meetings; and the less stressful nature of the journey.

An Accident Compensation Corporation spokesperson said that it would actively promote the train on health and safety grounds.

An important market revealed by the meeting was the corporate travel market, to meetings in Auckland. One speaker, representing a health sector company with 850 staff around the country but based in Hamilton, said that her firm would have at least 10 passengers on a daily basis on the train, and up to 30. She pointed to similar demand from other firms, like Fonterra and the University. A source outside the meeting has suggested that 20-30 people from Fonterra in the Waikato interact daily with Head Office in downtown Auckland. This supports the methodology above, which estimates that those living in Hamilton but employed in Auckland would form only 40% of the estimated patronage.

7. Revenue

(a) Possible Fare Levels

Current charges for the existing public transport services between Auckland and Hamilton in the morning and evening commuting periods are typically in the range of $19-$22 for coaches and $29-$49 for the *Overlander* (which in practice offers a service in the reverse direction). These are equivalent to 15-17 cents/km for coaches and 23-39 cents/km for rail. These rates can also be compared to those for rail travel between Pukekohe and Auckland which for an adult range from 18 cents/km for a single ticket to about 11 cents/km for a monthly pass. The fare from Palmerston North to Wellington on the *Capital Connection* is $22, or $176 for a 10-trip, equivalent to 16 and 13 cents/km. The *Overlander* fares on this link are the same as for Hamilton – Auckland.

For the purpose of this re-evaluation, an average rail fare of $24 has been assumed for travel between Auckland and Hamilton, equivalent to about 19 cents/km. This lies between the current rail and coach fares and takes into account a combination of full price and concessional travel. This about 15 per cent higher than assumed in the earlier 2006 study, a figure that is broadly in line with the increases in rail fares between Pukekohe and Auckland.

Fares for other journeys have been broadly based on this rate per km but with some adjustment for journeys to or from stations in the north of the Waikato to ensure consistency with the lower per-km rates for movements on the rail network managed by ARTA.

The (one way) fares assumed to be achieved for other journeys are as follows:-

Table 7.1
Assumed Fares

Route Section	Average Fare ($)	Fare/km (Cents)
Hamilton-Auckland	$24.00	$0.19
Ngaurawahia-Auckland	$20.40	$0.19
Huntly-Auckland	$17.60	$0.19
Te Kauwhata-Auckland	$14.90	$0.19
Pokeno	$11.30	$0.16
Tuakau	$9.60	$0.16
Pukekohe	$7.50	$0.15

(b) Revenues for 2009

Services via Newmarket

Using the unit revenues set out above and the patronage forecasts made earlier, the total revenues that could potentially be earned for a rail service operating in 2009 and providing a service via Newmarket, taken as the base case assumption, are set out in Table 7.2. These assume the operation of a reasonably high quality service able to attract not only commuters but other types of journeys including business trips, and trips for educational and other purposes.

Table 7.2
Annual Revenue Forecasts for 2009 : Services via Newmarket
($ million in 2009 prices)

Journeys between Auckland and:-	Central	Low	High
Hamilton	0.77	0.45	0.99
Ngaruawahia	0.04	0.02	0.05
Huntly	0.07	0.04	0.09
Te Kauwhata	0.04	0.02	0.05
Pokeno	0.11	0.07	0.15
Tuakau	0.14	0.08	0.18
Total	1.17	0.68	1.50
Total excl Pokeno and Tuakau	0.91	0.53	1.18
Hamilton and Huntly only	0.84	0.49	1.08

These figures are broadly in line with those produced in the 2006 Paling report after allowance has been made for inflation between 2006 and 2009

Services via the Waterfront

If it is not possible or desirable to route services via Newmarket, the option exists of routing these via the Waterfront route through Sylvia Park and Glen Innes. The analysis of the destinations of commuters between Hamilton and Auckland indicates that about 30 per cent are in areas served particularly by a station at Newmarket. If services were not routed through Newmarket it is likely that a portion of this traffic would be lost to rail. For the purpose of this exercise, it has been assumed that about half the total would continue to use rail services not via Newmarket, choosing to change either at Britomart or locations to the south.

The revenues that would result if services operated by the waterfront route are set out in Table 7.3:

Table 7.3
Annual Revenue Forecasts for 2009 : Services via the Waterfront
($ million in 2009 prices)

Journeys between Auckland and:-	Central	Low	High
Hamilton	0.66	0.38	0.85
Ngaruawahia	0.03	0.02	0.04
Huntly	0.06	0.03	0.08
Te Kauwhata	0.03	0.02	0.04
Pokeno	0.10	0.06	0.13
Tuakau	0.12	0.07	0.15
Total	1.00	0.58	1.29
Total excl Pokeno and Tuakau	0.78	0.46	1.01
Hamilton and Huntly only	0.72	0.41	0.93

Rerouting the service is forecast to reduce the overall revenues by about 15 per cent, but could give operational benefits which would offset this loss.

Note that the forecasts of patronage and revenues are broad estimates, prepared by Richard Paling. The actual revenues for what is a brand new service could be higher or lower, depending on economic conditions, service levels, different fare levels and

mix of fares to those assumed, and the marketing of the service. As well, the mix of stations chosen will affect the revenue. In the financial and economic analyses in this report, the train is assumed to pick up northbound passengers at Hamilton and Huntly only, via Newmarket (and set down at those places southbound) so the gross revenue assumed is the sum of the revenue from those two stations, namely $0.84m.

8. Costs

(a) Assumptions

Kiwirail have given a price for operating a service with the *Silver Fern* cars. This covers all operating costs, including interior refurbishment, except for Britomart access fees. No infrastructure costs (e.g. station refurbishment) are included.

The price is for a minimum 12 month contract, starting in July 2009. It covers three different scenarios for weekday services, from a basic 2 trips per day commuter service up to 6 trips per day including off peak services. The prices are indicative for discussion purposes; and are based on servicing at Otahuhu (and therefore a daily empty service to and from Hamilton, during the night). Further work is being done on basing the cars overnight at Hamilton, provided suitable secure storage is available, and servicing the cars during the day in Auckland. This would be more cost-effective.

The servicing crew is currently based in Auckland, as are the drivers. These are Kiwirail staff. On board staff are currently Veolia staff. There is a possibility of transferring the servicing and operating base to Hamilton, but this would require a long term commitment, to build the depot and staff capability, and to encourage staff transfer.

The service is envisaged as an express service, with the journey taking 2 hours. Kiwirail have assumed stops at Hamilton and Pukekohe, for a service terminating at Newmarket. Further stops and an extension to Britomart will add to the journey time. The cost of additional stops and extending the service to Britomart is likely to be minimal, apart from the terminal fees at Britomart. Potential stops are discussed below.

The costs are set out in the next section. Note that these costs are gross costs before revenue is taken into account. While Kiwirail is likely to physically collect the revenue, the revenue risk remains with EW (if they are the sponsor) and the other funders. This means that the net price will vary according to the revenue received, which may be more or less than estimated in this report.

Longer term a variety of contract mechanisms can be implemented with Kiwirail once revenues are established. These could range from a net contract, with the revenue (and revenue risk) accruing to Kiwirail, to an output based contract. An output based contract has a payment based on what is delivered, and could be based on seat kilometres or passenger kilometres.

(b) Costs of Service options

(i) One round trip per day
One morning and one evening peak service
$1.84m pa gross cost

(ii) Two round trips per day
One morning and one evening peak service
Two off peak services
$2.20m pa gross cost

(iii) Three round trips per day
One morning and one evening peak service
Four off peak services
$2.65m pa gross cost

These figures do not include GST.

These costs assume all operations are conducted with the same vehicle. For that reason, the marginal costs of trips beyond the primary commuter trips is quite low, about $350-800,000, depending on the number of trips run. This means that a more intensive service than initially contemplated could be viable, which would make the service more attractive because it would offer more choice and flexibility relative to the base one return per day. If more than one vehicle is involved, for instance to give two closely spaced services morning and evening, then as a rule of thumb the costs would double.

The analysis in this paper is based on the one return peak service scenario only, option (i) above.

(c) Britomart

Britomart is owned by the Auckland City Council, and operated on their behalf by ARTNL (Auckland Regional Transport Network Ltd). They charge for the use of the facility by trains, based on the actual use made of the station. Currently the charge is, in round terms, $5 per minute of dwell time. A reasonable assumption for the time the Waikato train will use the station is 10 minutes, twice per day. This covers the time taken from arrival in the morning to departure for Otahuhu, and reverse in the evening. The same time would be taken if the four trains per day option was chosen, because the train would then leave for Hamilton instead of Otahuhu. However, a further 10 minute period would be incurred for the 6 trains per day option.

$5 per minute for 10 minutes twice per day is $100 per day. On the basis of 250 weekdays per year, Britomart would cost $25,000 a year. This is a relatively small cost in the overall scheme of things.

(d) Other stations

No allowance has been made for tidying up existing stations, nor for their regular maintenance. It is assumed that the costs of any initial tidy up would be small. Station maintenance for Waikato stations is not provided for in the Kiwirail estimate, but is also likely to be only small. Stations in the ARTA area, other than Britomart, are maintained by ARTA. They would expect to be paid for using them, at a total level similar to Britomart, depending on how many are used; any such fee is assumed to be included in Kiwirail's proposed charge.

(d) Capital

No allowance has been made for any capital expenditure. The cost of "full refurbishment" is being borne by Kiwirail and is factored into the price they have presented. It is assumed that this includes the interior and any necessary mechanical

work. In fact, no capital needs to be spent by the region at all in the early stages, as the likely stations in the Waikato have existing facilities (indeed, are chosen in part because of that).

(e) Marketing

Kiwirail will undertake basic marketing within their price. No allowance beyond that has been made for marketing. In principle, marketing should pay for itself in terms of additional patronage. Since the revenue income and risk lies with EW and the other funders, some of the marketing should also fall to them. An estimate can be prepared if the region decides to move forward with the proposal.

9. Financial and Economic Analysis: Preliminary Assessment of the Business Case

(a) Introduction

Revised forecasts of the potential traffic likely to use a new commuter rail service connecting Hamilton and Auckland have been set out above. This section uses the patronage and revenue forecasts to develop a preliminary business case for the proposed scheme.

This preliminary business case has been developed for the operation of a service for commuters only providing one trip per day in each direction between Hamilton and Auckland. No examination has been undertaken of the position if additional services were operated between the morning and evening peaks although as has been indicated the incremental costs of these services would be low. There would however be less impact of any diversion of traffic away from the road network with any off-peak services and as a result this component of the benefits is also likely to be fairly limited.

There are a number of options for operating the proposed services including the stations to be served between Hamilton and Auckland and the route to be taken by the service. For this appraisal it has been assumed that the service would call at:-

- Hamilton (Frankton Junction)
- Huntly
- Papatoetoe
- Newmarket
- Britomart

Because of this the service would be routed via Newmarket rather than via the waterfront. Whether this option can be achieved, will, however, depend on ARTA's agreement, and their position is that there is no room for the train. The potential routes are discussed further below.

The traffic and revenue forecasts on which this preliminary business case appraisal is based are those identified for the central case with Newmarket, in section 6, and with Waikato stops at Hamilton and Huntly only. Stopping at other locations would improve the revenues and economic benefits, but would incur costs and could result in resistance from ARC/ARTA is this was perceived to be a factor in encouraging development beyond the Metropolitan Urban Limits.

(b) Costs of the Proposal

The costs of operation are set out above. The principal costs of the proposal are the operation of the *Silver Fern*, and access to Britomart. Other costs are assumed to be small and not significantly affect the overall costs.

The operating scenario used in the business case is the one return peak service, costing $1.84 million, excluding GST. Access to Britomart is estimated above at $25,000 per year.

The total operating costs are thus estimated at $1.87m per year

(c) Financial Appraisal

Introduction

The financial appraisal is based on the costs and revenues of the operation and identifies the extent to which the operation would need financial support. The evaluation has been undertaken over a 15 year period with operating costs and revenues incurred in all years, since there are no capital works associated with the scheme.

Revenues

The revenues generated by travellers have been estimated above. In 2009 for the option defined for this preliminary appraisal would amount to about $0.84 million per year, based on passengers from Hamilton and Huntly (Table 7.2). However this total includes GST and so the revenue available to offset the costs of the service would be one-ninth less when GST is excluded. In addition because of the costs of a ticket averaging about $24 one way, it is likely that a large proportion of tickets would be purchased using EFTPOS or credit cards. It is broadly estimated that this would cost on average about 3 per cent of the cost of the ticket. These factors reduce the revenue available to the service operator to at about $0.73 million per year.

It is forecast that traffic and revenues would grow by 4 per cent per year in line with the potential growth forecast for the period from 2006 to 2009. Note that this assumes that patronage has reached a steady state apart from natural growth by the end of the first year, that is the ramp up as people get to know about the service and try it will all take place in the first year.

Costs

The costs of the service have been described above and are estimated at about $1.87 million per year.

Overall Financial Appraisal

The details of the financial appraisal are set out in Table 9.1. This and the next table are based on the central scenario, and on serving Hamilton and Huntly in the Waikato. In accordance with NZTA procedures, the funding gap has been identified,

which is the equal annual sum which would be required to support the operation to ensure that that the costs and revenues plus funding support are in balance. [3]

Table 9.1
Financial Analysis
($ millions at 2009 prices)

Year	Revenues		Costs			Op Surplus/ (Deficit)	"Funding Gap"
	Gross	Exc GST and other costs of selling	Rail Operation	Britomart Access	Total		
2009	0.84	0.73	1.84	0.03	1.87	-1.14	0.97
2010	0.87	0.75	1.84	0.03	1.87	-1.11	0.97
2011	0.91	0.78	1.84	0.03	1.87	-1.08	0.97
2012	0.94	0.82	1.84	0.03	1.87	-1.05	0.97
2013	0.98	0.85	1.84	0.03	1.87	-1.02	0.97
2014	1.02	0.88	1.84	0.03	1.87	-0.98	0.97
2015	1.06	0.92	1.84	0.03	1.87	-0.95	0.97
2016	1.10	0.95	1.84	0.03	1.87	-0.91	0.97
2017	1.15	0.99	1.84	0.03	1.87	-0.87	0.97
2018	1.19	1.03	1.84	0.03	1.87	-0.83	0.97
2019	1.24	1.07	1.84	0.03	1.87	-0.79	0.97
2020	1.29	1.12	1.84	0.03	1.87	-0.75	0.97
2021	1.34	1.16	1.84	0.03	1.87	-0.70	0.97
2022	1.40	1.21	1.84	0.03	1.87	-0.66	0.97
2023	1.45	1.26	1.84	0.03	1.87	-0.61	0.97
NPV @ 12% over 15 years							
	$7.03	$6.08	$12.53	$0.17	$12.70	-$6.62	$6.62

The operation would need fairly substantial support with the revenues only covering about 40 per cent of the costs in 2009 but rising to about 68 per cent by 2023. The financial benefit: cost ratio (or more correctly net revenue: cost ratio) would be 0.5. The NPV of the funding gap would amount to about $6.6 million over the 15 years of operation. This is under 60% of the funding gap for the proposal in the Paling Report.

A financial BCR of 0.5 for a public transport proposal is not inconsistent with typical conditions in New Zealand and overseas. For ARTA, the typical cost recovery ratio is of the order of 60 per cent overall, but with rail services having a lower cost recovery ratio of about 40 per cent. In the Waikato as a whole, passenger fares are reported to cover about 18 per cent of the costs of providing public transport services and in Dunedin about 35-45 per cent of costs. Overseas, London fares cover about 60 per cent of operating expenditures, with capital expenditures treated separately.

(d) Economic Appraisal

The economic appraisal is based on the funding gap plus the benefits to both public transport users and other road users. The elements of this are discounted at 8 per

[3] The funding gap is defined in the Volume 2 of the NZ Transport Agency's Economic Evaluation Manual as "the deficit in cash flow that needs to be funded by local and central government if the proposal is to be financially viable from the service provider's point of view, based on the best estimate of service provider revenue and the service provider's desired rate of return." It is calculated as a constant annual funding stream which has a Net Present Value equal to the annual funding deficits calculated on a year by year basis which would need to be met by local or central Government for the service to be operated. For the purpose of this analysis the funding gap has been calculated over a 15 year evaluation period and discounted at a real discount rate of 12 per cent.

cent per year as compared to the discount rate of 12 per cent used for the financial appraisal, in accordance with NZTA procedures.

Benefits to public transport users

The benefits to public transport users are based on the difference between charge for the service and the total willingness to pay following the approach set out in Volume 2 of the NZTA Economic Evaluation Manual ("EEM2"). Following the approach developed in the earlier Paling report appraisal, the maximum price that users would be prepared to pay has been based on the fares and demand and a fairly conservative assumed fares elasticity of -1. Using this approach the maximum fare that would be payable would be $48.

The use of an elasticity closer to zero in line with the recommendations in the EEM would give rise to a higher willingness to pay since the maximum fare would increase. However there are a large number of uncertainties associated with the estimation of the willingness to pay and in particular the extent to which users would be prepared to pay high fares for the journey and so a conservative approach has been judged to be appropriate.

Using this approach the benefits to PT passengers from the new service would amount to about $0.42 million per year in 2009, rising with growth in patronage.

Road User Benefits

Road user benefits have been estimated on the basis that the attraction of trips to the new public transport service would result in a reduction in the number of car trips of 72.5 per cent of the numbers of these trips (in line with EEM2). In line with the earlier appraisal it has been assumed that these trips would have travelled for 25 kilometres on congested roads, saving a total of 0.65 million vehicle-kilometres per year. Using the figures in EEM2, the benefits per kilometre saved in Auckland amount to $1.56, giving a total benefit in 2009 of $1.02 million per year. Benefits would again increase as patronage grows.

Overall economic benefits

The overall economic benefits over the 15 year evaluation period are set out in Table 9.2. Both PT and road user benefits are forecast to increase by 4 per cent per year in line with the forecast growth in patronage of the service.

Table 9.2
Economic Evaluation
($ millions at 2009 prices)

	Funding Gap	PT User benefits	Road user benefits	Total benefits	Net benefits
2009	0.97	0.42	1.02	1.44	0.47
2010	0.97	0.44	1.06	1.49	0.52
2011	0.97	0.45	1.10	1.55	0.58
2012	0.97	0.47	1.14	1.61	0.64
2013	0.97	0.49	1.19	1.68	0.71
2014	0.97	0.51	1.24	1.75	0.78
2015	0.97	0.53	1.29	1.82	0.85
2016	0.97	0.55	1.34	1.89	0.92
2017	0.97	0.57	1.39	1.96	0.99
2018	0.97	0.60	1.45	2.04	1.07
2019	0.97	0.62	1.50	2.12	1.15
2020	0.97	0.64	1.56	2.21	1.24
2021	0.97	0.67	1.63	2.30	1.33
2022	0.97	0.70	1.69	2.39	1.42
2023	0.97	0.73	1.76	2.49	1.52
NPV @ 8% over 15 years					
15	$8.30	$4.53	$10.98	$15.51	$7.21
BCR					**1.9**

For the economic evaluation, the combination of benefits to PT users and to road users is larger than the funding gap for the project and the scheme achieves a BCR of 1.9, comfortably in excess of 1. For earlier public transport proposals in New Zealand, LTNZ were prepared to fund proposals with BCRs only slightly in excess of 1. Compared with this the BCR of 1.9 estimated for the current rail proposal would therefore in principle appear to be reasonably attractive.

(e) NZTA Prioritising

NZTA assesses priorities, especially for roading, by judging projects on a high/medium/low scale against three criteria: seriousness and urgency, effectiveness, and economic efficiency. However, its approach to public transport schemes is that they tend to be assessed on an individual basis, rather than on the more formulaic basis adopted for highway schemes. Using the NZTA criteria the scoring is probably realistically MML or at best MHL (which means medium on the first criterion, high on the second, and low on the third), with the H reflecting the regional development component, which probably needs further review. Rather than developing what may be a rather artificial scoring for the project, it is probably best to review with NZTA the way in which they would like the results presented.

(f) Other LTMA Criteria

The earlier Paling report assessed the project against other LTMA criteria, and these assessments are likely to be relatively stable. What has changed, however, is the new government's emphasis on economic development as the key criterion, along with relief from congestion. The proposal contributes to both.

Anecdotal evidence has suggested that there is considerable interaction between companies and other agencies located in Hamilton and In Auckland. The improvement of the transport linkages between these would potentially improve their integration and their economic efficiency, especially if the time spent travelling could be used productively. As a consequence the proposal can be regarded as beneficial in terms of its impact on economic development, and if it prompts further development of services in the longer term this rating would improve.

On accessibility and mobility the 2006 proposal also scored moderately beneficial, which might alter slightly since the *Silver Fern* cars do not have very good access for the disabled. On safety and personal security and public health, the rating was broadly neutral.

In terms of sustainability, the use of rail over road and potential for development of rail services meant that the rating was beneficial. A recent report on rail sustainability for NZTA[4] notes the Hamilton train as a good opportunity to increase passenger rail, in the overall context of sustainability. "Many stakeholders believed that a reliable high speed service, especially between Auckland and Hamilton, could be developed as a viable alternative to road and aviation."

The rating for integration was neutral to moderately beneficial, and for responsiveness, it was beneficial.

The overall assessment on the LTMA criteria is that if the project can be regarded as moderately beneficial. The revised work on the proposal will not have worsened this assessment.

(g) Overall Assessment

The preliminary analysis of the financial and economic viability of the proposed new commuter rail service between Hamilton and Auckland indicates that:-

- The revenues generated by the new service would fall significantly short of the associated costs and substantial financial support in excess of $1 million per year would be required over the first 5 years of operations.
- The benefits from PT users and other road users would however be greater than the funding gap for the services and the project would achieve a BCR (Government) of 1.9. There is therefore a reasonable economic case for the project.
- The project also scores reasonably well against other more qualitative LTMA type criteria, along the lines set out in the 2006 report.

(h) Sensitivities

The financial and economic analyses are sensitive to revenue and patronage assumptions, because up to the capacity of a *Silver Fern* unit, 96 people, the costs do not vary. For that reason the inclusion of the Huntly stop reduces the funding gap from an NPV of -7.2 to -6.6, and improves the economic BCR from 1.6 to 1.9. Patronage and revenue are thus assumed to be from Hamilton and Huntly only, as set out in sections 6 and 7 above.

[4] P McGimpsey, J Havemann, J Sutcliffe, *Promoting sustainability in New Zealand's rail system*, NZTA Research Report 370, 2009. See p. 77

Adding a further stop, such as Tuakau or Pokeno, would, on the revenue forecasts in Table 6.2, have an even greater impact. The economic BCR if either of these two stations were added would be over 2. However, adding too many stops will affect the transit time, and may undermine the service quality for Hamilton users. In addition, there are no platforms or shelters at Tuakau and Pokeno, so some capital would have to be spent to provide these. The inclusion of these stations would also raise concerns about containing development within the existing Metropolitan Urban Limits and may therefore be opposed by ARC or ARTA.

As noted above, the analysis assumes the Newmarket route is chosen; if the waterfront route has to be used, annual revenue is reduced by about 15%. Patronage is in both cases assumed to grow at 4% a year.

A further range of sensitivity tests was undertaken based on the low and high patronage and revenue assumptions and the results are set out in Table 9.3. In undertaking the test under the High scenario the effects of the limited capacity available in the *Silver Fern* have been recognised and revenues and economic benefits have been held constant from 2012. These still assume Hamilton/Huntly revenue and the Newmarket route.

Table 9.3
Results of Sensitivity Testing

	Financial Appraisal		Economic Appraisal	
Scenario	Funding Gap (NPV $millions)	Revenue Cost Ratio	Total Economic Benefits (NPV $millions)	Economic BCR
Low	5.7	0.3	9.1	0.8
High	9.2	0.6	17.4	2.4

The results of the sensitivity testing set out in Table 9.3 indicate that the financial and economic returns are sensitive to the scenarios developed, although even in the Low scenario the proposal achieves a BCR that is fairly close to 1. With the High scenario the BCR improves to 2.4, which would give it a “Medium” rating on the standard NZTA evaluation criteria.

The results are sensitive to Kiwirail’s cost estimate. It is assumed that this covers all expenditure required, apart from Britomart fees. Further discussion with Kiwirail is required to refine the costs. The analysis also assumes only one service per day, and the use of only one *Silver Fern* vehicle.

10. Route and Station Options

(a) Route in Auckland

Figure 10.1 shows the alternative routes into Britomart.

Figure 10.1
Auckland Rail Routes

There is likely, at least for the first year, to be difficulty in using the Newmarket line and calling at Newmarket. The alternative line via Sylvia Park and Glen Innes ("waterfront line", see Figure 10.1) is flatter and has fewer trains on it, though longer, but would be less attractive to passengers. This is because Newmarket is a key focus of public transport patronage because of the employment and retail shops there. On the waterfront line a possible alternative is the new shopping centre at Sylvia Park. It is however likely that using that route would lower overall patronage and worsen the financial and economic position of the service (see Tables 7.2 and 7.3). For that reason the first choice, and the choice on which this report is based, is a route through Newmarket. Access and capacity issues arising from this choice are dealt with below.

(b) Stations in Waikato

As noted, the aim of this service is to start small, so the initial stations selected are those with good patronage possibilities, but no capital expenditure requirement. There are existing platforms and shelters at Hamilton (Fraser St, Frankton) and Huntly.

As noted in the sensitivity section above, the likely demand at Tuakau and Pokeno would be a valuable contribution to the viability of the service. At both places, however, both platforms and shelter would have to be provided. It is unlikely that Kiwirail would fund those facilities, leaving either Franklin District or ARTA to do so, or possibly a developer interested in enhancing land values. The stations are in the Auckland region for transport purposes.

The patronage estimates also show that Te Kauwhata and Ngaruawahia have potential patronage. Both have platforms, but no shelters. The Paling Report identified Te Kauwhata as a growth area.

A further station in Hamilton has been mooted for The Base shopping centre at Te Rapa. This would cater for passengers from the north of the city, and also the east (via Wairere Drive) and north-west. It would need to be built from scratch, as there are currently no facilities. It could be funded by Hamilton City or the shopping centre owners. At present it is viewed as a logical development when the initial service has proved itself. It is understood that the group developing The Base would be supportive of the development of a station in the area.

It has been suggested that the train could start at Te Awamutu, where there is a platform and shelter. The departure time would be about 20 minutes prior to a Hamilton departure. At the 16 April public meeting it was felt that patronage further south again at Otorohanga (another 20 minutes) would not use a train timed for commuters but rather would be ad hoc passengers using one of the middle of the day services (if they were provided). The Te Awamutu option needs further analysis, which could be done after the basic service is introduced. This report includes no patronage south of Hamilton.

(c) Stations in Auckland

Stops in the Auckland suburban area would be limited to keep the transit time low. The primary function of such a stop is to allow passengers on the Waikato train to access stations that it does not stop at, by transfer to a suburban train. Apart from Newmarket, one south Auckland station could be served. Kiwirail's proposal is for this to be Pukekohe, but this is unlikely to be a destination in its own right for Waikato people, and its own originating patronage is now catered for by ARTA trains. ARTA has indicated that it would expect passengers boarding at stations in Auckland (northbound) to hold one of its MAXX tickets, or perhaps pay a premium fare to limit such short-haul traffic. The same would apply for passengers alighting at those stations southbound. The revenue that might be expected from Pukekohe is thus eliminated, or the demand reduced.

A better choice is felt to be Papatoetoe, which offers good links into the suburban train network (and after electrification, 12 trains per peak hour, going to Auckland by both routes). More immediately, it offers a 15 minute connection to the Auckland Airport every half hour by bus route 380. The same bus also connects with Manukau city centre. The train timetable would need to connect with this bus.

The choice of Auckland stations is not fixed, and indeed could be changed with experience. Since they are ARTA stations, however, their permission will be needed to stop at them.

11. Track Access Issues

Under the Auckland Access Agreement and Common Access Terms signed between Tranz Rail, ARTA and the government when the track was sold by Tranz Rail in 2002, the rights to run trains were allocated between ARTA and Tranz Rail. These agreements remain in force, and Tranz Rail's rights and obligations now lie with Kiwirail.

(a) Newmarket route

The agreement did not provide any rights for Kiwirail to run peak hour trains on the line from Westfield Junction through Newmarket to Britomart. Consequently, the proposal to run the Waikato service through Newmarket is dependent on ARTA's approval, which is unlikely to be given (see below). The actual timetable has to be approved by a timetable committee representing the track owner and operators.

(b) Waterfront route

Kiwirail has rights to run two trains per peak hour in each direction as far as Britomart via the waterfront line. The same two slots are also available to Kiwirail south of Westfield junction. It is probable that the Waikato train can use one of these slots each way, morning and evening. Even if the Newmarket route is unavailable because of ARTA objections to its use, the waterfront option remains.

(c) Britomart terminal

As noted above, access to this terminal is controlled by ACC through ARTNL, and is available by agreement and by payment of a fee. Kiwirail has no negotiated slots into Britomart, apart from those for the *Overlander.* Its waterfront route slots go only to the station entrance.

(d) ARTA viewpoint

ARTA's requirements were discussed at a meeting with them. Although they are in general terms sympathetic to a Hamilton service, they say there is no room for an additional train at peak hours, at least not after their planned timetable changes this year and next. These changes will increase the numbers of train services run, and ARTA say they could fill up further slots than those made available to them. Implicit in this is the not unreasonable view that their trains come first.

Their suggested alternatives included a train arriving after the morning peak and returning before the evening peak. This would serve a different market from the one proposed, and a market that is likely to offer less patronage as well. The extent of the likely patronage should be explored to see if this option is viable. It could be operated by the *Silver Fern* cars via Newmarket.

Another suggestion was to extend one of their Pukekohe locomotive hauled trains. Up to 2 additional carriages could be made available within the constraints of platform length at Britomart. These would have to be built to higher standards than the SA suburban cars, to cope with the longer journey (e.g., with toilets). They would thus be new cars. The train's maximum speed would be lower than the *Silver Fern*'s, and it would stop all stations from Pukekohe to Britomart, to serve ARTA's passengers. This journey would thus be slower than 2 hours, and from public feedback, it would be unlikely to appeal to Waikato users. It would also be some time before carriages could be built for it.

The option of terminating a *Silver Fern* commuter train at Newmarket was also not acceptable to ARTA.

If ARTA's viewpoint prevails, the concept of the trains that could be run changes significantly from that proposed. In effect, if ARTA is correct, a realistic commuter service cannot be run from Hamilton. It should however be recognised that travellers other than commuters would represent the majority of the travellers forecast for the service.

ARTA's view is in contrast to that of Ontrack planning officials, set out under capacity issues, below. Ontrack believes that once signalling and track improvements at Quay Park are commissioned, at the Christmas break 2009/10, then there will be sufficient capacity and flexibility in the way Britomart can be operated that all the trains ARTA want to run under electrification via Newmarket could be run, with room for the Hamilton train.

However, those responsible for operating the Auckland signalling feel that operating at this theoretical capacity places too great a load on signallers, which could result in degraded service (wrong routings, etc). That will be solved by new signalling arrangements, including automatic route setting, and train describers that help signallers, about mid 2010. Meanwhile large increases in train numbers pose difficulties, and the operation needs more detailed modelling to resolve. On the other hand, a single additional train may not be so problematic.

ARTA has also noted that Ontrack has concerns about congestion at Otahuhu with the June timetable change. These relate to the capacity of Otahuhu as a turnround station, and an additional through train should not worsen that (although that train would be impacted in the case of any delays).

The issue may boil down to one of timing. Until Quay Park is commissioned and other signalling and control improvements made, there may be limits on Newmarket trains into Britomart. It may nevertheless be possible in the interim to run the Hamilton service via the waterfront, on Kiwirail's rights, and when the capacity for Newmarket trains is enhanced, change it to that route. Permission to enter Britomart will still need to be negotiated.

There are thus two schools of thought on the availability of capacity, which need to be resolved. The Auckland Common Access Terms provide a mechanism for determining timetables, time slot allocation, and resolution of disputes. It starts with a timetable committee which decides what can be achieved through the use of modelling and other tools. If it cannot agree, then the issue is mediated, arbitrated, or referred to a third party expert. The issue about the path for the Hamilton train will have to be put to the committee as the formal route for such issues. It would also be prudent to have direct talks between ARTA, EW, and Kiwirail (Ontrack and Rail Passenger), at the very least to define the issues for the timetable committee, and potentially to resolve the issue.

12. Capacity Issues

At present, the suburban train density is such that there are no serious capacity problems, apart from the limited Newmarket – Britomart paths. However, when the suburban lines are electrified, or when train numbers are increased before then, certain parts of the network will have 12 or more suburban trains per hour, which does create some capacity issues.

(a) Puhinui – Westfield

Between Puhinui (junction for the new Manukau branch) and Westfield, there will be 12 trains per peak hour, plus possibly 2 Pukekohe trains. Even with these trains, there will be room for a Waikato train. The signalling system has to be renewed for electrification, and it is being designed to permit denser train patterns. The contract for renewing this signalling was signed in April 2009. With a train every 4-5 minutes, however, it is likely that the Waikato train's speed in parts of this section will be reduced to the average speed of the stopping trains.

(b) Waterfront

There will be only 6 trains per peak hour on this section plus possibly the 2 Pukekohe trains, so no capacity problems are expected.

(c) Penrose – Newmarket – Britomart

From Westfield Junction to Penrose there will be 6 trains per peak hour (possibly plus 2 Pukekohe trains), and from Penrose to Newmarket, 2 additional trains to or from Onehunga. There will be no capacity issue on that section. The Onehunga trains are expected by Ontrack to terminate at Newmarket (though ARTA would like them to run to Britomart).

From Newmarket to Britomart there will be 12 trains per peak hour, plus possible 2 from Helensville and 2 from Pukekohe. On the actual track there will be enough capacity, as the signal spacing allows a nominal 3 minute headway (20 per hour, if they can simply pass through the section). The issue for this section is the capacity of Britomart itself.

(d) Britomart terminal

Currently Britomart is limited to 9 trains/hour via Newmarket. Recent improvements to the trackwork and signalling system (to be commissioned at Christmas 2009/10) will allow 12 trains in and 12 trains out serving the two platforms on the city side of Britomart, from Newmarket. This is achieved by running trains in both directions on each track in the tunnel at Britomart entrance. The proposed mode of operation involves bringing two closely following trains in on the up (inbound) track from Newmarket to Quay Park Jn, then down the up track into Britomart, exchanging passengers, and sending these two out on the same up line to Quay Park, before the next pair is admitted. From Quay Park to Newmarket they will use the down (outbound) track.

This will accommodate the 6 trains/hour from Swanson and the 6 from Papakura.

Once the new bi-directional signalling and improved trackwork is commissioned, there is an opportunity to bring trains in from Newmarket, running on the "wrong" (down) line from a crossover at Parnell to Quay Park, and in and out of Britomart via the down track from Quay Park. This enables trains coming from Newmarket to access platforms 1-3, and particularly 3, in addition to the 12 operating on the normal line from Parnell and using platforms 4 and 5.

These trains would have to be timed closely with the movement of the 12 in and out of platforms 1 and 2, and fit in the gaps between the pairs of trains from those

platforms wanting to use the up line between Quay Park and Parnell (as well as fitting around the Manukau trains ex the Waterfront line). There is believed to be sufficient time to run a Hamilton train in this way, along with the 2 Helensville trains, if they end up running to Britomart. It may be possible to also accommodate one or both Pukekohe trains, but that would need closer modelling.

Clearly this pattern of operation would have to be approved by the owners of Britomart and by ARTA, but it does appear technically feasible, and offer the ability for the Hamilton train to serve Newmarket. As noted, however, improvements to the actual signallers' technology will also be needed to enable this to work reliably.

(e) Track Condition South of Auckland Area

Recent work has improved the transit time for passenger trains through this section, and still further work is planned. Kiwirail Passenger Group is comfortable that a 2 hour transit time can be achieved and maintained.

13. Funding

(a) NZTA

On the basis adopted for Auckland and Wellington, NZTA would be expected to pay 60% of the net costs of the train. On the numbers presented above, the net cost (in the first year) is $1.14 million. 60% of this is $684,000. With passenger growth, it reduces each year thereafter. To qualify for this funding, the amount must be included in the National Land Transport Programme, and to get in that programme, it must be in the Waikato Regional Land Transport Programme.

At this stage it is in neither programme. There is however an opportunity to include it the Waikato programme as a result of the hearings on the plan, due to start on 5 May. Even if it is included in the RLTP, there is no guarantee that it will be included in the NLTP, because priorities from all regions have to be juggled to fit available money, and also because the focus of spending in this year's NLTP is likely to be on roading.

In accordance with NZTA procedures, a procurement procedure will have to be established to permit the services to be purchased from Kiwirail. This should not be an obstacle, as similar procedures already exist. This process will also test the Kiwirail pricing and its value for money. NZTA has not funded interregional rail projects before, but this should not be a serious impediment.

The amount involved is very small in terms of the overall 3 year funding requirement for the region, and only 6% of the amount requested in the RLTP for public transport services and operations. Including it as a high priority could nevertheless impact on other public transport priorities.

(b) Local share

The balance of the net cost, $456,000 has to be found locally. The apportionment of the local share amongst organisations with an interest (potentially including ARC or ARTA as well as Waikato bodies) has yet to be negotiated.

(c) Timing issues

Even if the proposal can be put into the RLTP, it is understood that raising the local share on short notice is very difficult. However, without full funding, the service will not be run by Kiwirail, and if the service is not funded to begin in July, then there is a very real risk that the *Silver Fern* vehicles will be reallocated to some other task.

It may be possible to explore an arrangement with NZTA that it pays a higher share of year 1 to get over this problem, and the region/city pay a correspondingly high share in year 2, or a similar rebundling of the funding requirement.

14. Risks

The risks that the proposal does not result in a train being run or is unsuccessful have been noted in this paper. In summary, they are:

- Network and time slot constraints: this still needs agreement on the technical aspects of operating at Britomart and access through the Newmarket route.
- Funding and timing of funding. Without national and regional/district funding there is no possibility of the train running. Without early funding (by July 2009) there is a strong risk that the *Silver Fern* car will no longer be available.
- Revenue risk. If revenue is not up to expectations, then the net cost of the service increases. This would be borne by those who contribute to the funding, including NZTA and local share organisations. Correspondingly, there is a "risk" that patronage will be above expectations, which would offset the required funding.
- Cost risk – the costs from Kiwirail are indicative, and could rise or fall.
- If the service is successful, there may be a need for further refurbishment and mechanical maintenance in later years.
- ARTA's opposition might mean the train would not be able to enter or leave Britomart, or the inner part of the suburban area, inside the morning or evening peak periods.
- There is also a risk that ARC may oppose the train because the provision of the train will promote growth south of the Metropolitan Urban Limit. ARTA have also raised this issue.

15. Potential Developments

If the initial service is successful, there are a number of opportunities for extension to bring yet further benefits. These include:

- Investigation of further stopping stations in Waikato, and of the trade-off between extra stations and journey time. One further stop (e.g. Pokeno or Tuakau) might bring benefits in excess of costs, especially if a developer would meet the cost of facilities.
- Development of new stations, such as at The Base
- Redevelopment of existing station facilities
- Further services with the same vehicle to give 2 or 3 round trips per day
- Further peak hour services using a further vehicle

- Starting the train
    - Further south, at Te Awamutu or Otorohanga; or
    - Further east, at the city centre underground station, or Claudelands, Cambridge, or Morrinsville.

16. Further Work

Immediate further work includes:

- Early funding options: EW and HCC need to work on sources of funding that can be made available by July 2009, including NZTA.
- Inclusion of the proposal in the RLTP at a priority that will give a good chance of inclusion in the NLTP.
- Surveying local firms to get a more detailed understanding of the potential business market for the proposed service and a service outside the peak.
- Development of the detailed train timetable, including agreement from the Waikato end on stops, and from ARTA re Papatoetoe.
- Seeking agreement with Kiwirail (including Ontrack and Rail Passenger), ARTA, and ARTNL over track access and operational issues in the Auckland area, especially about use of the Newmarket route and Britomart terminal.
- Negotiation with Kiwirail to refine and firm up the price
- Negotiation with Kiwirail about a start date, including dealing with funding issues and their timing (including the date the NLTP will be known). This will include exploring options for delaying the start of the service if funding is not available.
- Development of a basic marketing plan in conjunction with Kiwirail

17. Conclusion

A rail service from Hamilton to Auckland could be established as early as July 2009, although negotiation on access through Auckland will be required, and possibly temporary use of the waterfront line. The business case shows it to have benefits comfortably in excess of costs, with a BCR of 1.9. It meets the new government requirements of benefits in terms of economic development and relief of congestion. It will, however, always require a subsidy, which is over $1m a year in the first five years. That subsidy requires NZTA and local funding. More problematically, funding is required more quickly than the normal local processes permit, because the vehicles have alternative uses. The Waikato now has an opportunity to secure a service, but it needs prompt action.