29 May, 2009

The Secretary
Select Committee on Train Services,
Legislative Council,
Parliament of Victoria,
Spring Street,
MELBOURNE VIC 3002

Dear Sir or Madam,

RE: Select Committee on Train Services
Submission from Professor Graham Currie, Chair of Public Transport, Institute of
Transport Studies, Monash University

I refer to your letter of April 20 inviting me to provide a written submission to your Inquiry. This
submission is structured as follows:

- Basis of the submission
- Factors leading to and causes of failure of train services in Victoria
- Closing Comments.

BASIS OF THE SUBMISSION

I wish to clarify the basis of my submission and in particular outline my credentials and rationale. My
name is Graham Currie I hold the first professorship in public transport in Australia and am based at
the Institute of Transport Studies at Monash University. The Institute is the designated ‘key centre’ in
transport management by the Australian Research Council. The chair is funded by Monash
University and by the public transport organizations and government in Victoria. This includes the
Department of Transport, Metlink and VicRoads. One of the five Metlink partner organizations is
Connex who currently run train services on the metropolitan network. The chair is an informed
independent source of expertise on public transport planning. It aims to increase knowledge and
learning about public transport for all involved in the industry as well as the community and decision
makers at all levels.

I have held the chair since 2004 and have over 30 years experience in planning and designing public
transport systems and in researching and teaching public transport planning. I have led planning
studies of public transport systems throughout the world and also in every state, territory and most
towns in Australia.

This submission represents my view in relation to the factors leading to and causes of failure of train
services in Victoria. It does not necessarily reflect the views of the Institute, Monash University or
any of my sponsors.

FACTORS LEADING TO AND CAUSES OF FAILURE OF TRAIN SERVICES IN VICTORIA

The terms of reference of your select committee does not clarify what failures of metropolitan or
V/Line train services are the focus of the inquiry. However given the timing of the announcement of
the committee it seems logical to me that its principle focus might be on the breakdown of rail
operations which occurred during the heat wave of January and February 2009.
Figure 1 presents an analysis of the limited train service reliability data which is publicly available. As can be seen there is a fairly consistent trend towards a decline in punctuality (% trains on time) since around 2002. Punctuality in early 2009 fell to levels which were significantly below this trend. Reliability (% trains not run) has been getting worse also since around 2002 however not at a rate of
increase as high as that shown for punctuality. However early 2009 reliability performance is, like punctuality, consistently worse than the trend.

My interpretation of these statistics is that overall performance of both V/Line and Metropolitan railways has been worsening for some time but the failures of early 2009 were particularly bad. From my viewpoint both the trend and the early 2009 performance are both issues of great concern which the inquiry should be focusing on.

The key question which is arises is the cause for these problems.

There has been much debate within the media suggesting it is the performance of the rail operator, Connex, which is to blame for the performance problems of the metropolitan railways. In my opinion there is no publicly available information which can be used to either prove or disprove that the rail operator is the cause of these issues. Here are some facts which I think inform a judgment about this issue:

- Performance of both V/Line and Metropolitan railways have shown consistent trends in long term performance decline as well as significant deterioration of operations in early 2009. If Connex was the problem why does V/Line passenger, which is operated by the Government, also share similar trends?
- The long term trend in decline of performance for both punctuality and reliability started in 2002 in the Bayside as well as the Hillside railway companies. Connex only operated Hillside at this time. If Connex is the problem why does Bayside also show performance problems at this time?

Based on my own experience of planning railways and also from particular experience of the Victorian railway context I believe a major problem has been the long term lack of investment in railway infrastructure. I feel this issue is the principal cause of the punctuality and reliability trends and the early 2009 failure of the railways identified in Figure 1. To this must be added the considerable pressures which have resulted from increased patronage of the railway system. Figure 2 is the result of an analysis I have undertaken of annual ridership, punctuality and reliability trends since 2000/2001. Ridership, punctuality and reliability statistics are each rebased to an index of 100 to represent their values in the 2000/2001 financial year with trends thereafter measured as a share of 2000/2001 values.

This analysis shows a consistent trend between ridership growth on both the Metropolitan and V/line Passenger network and the long term decline in performance of these railways in terms of punctuality and, to an extent, reliability. I believe therefore that ridership growth is one of the causes of failure of these railways. There is some support for the mechanisms causing this within research literature. A considerable breadth of research has illustrated that the volume of passengers using railways is a principal driver of the length of station dwell time of trains (Weston,1989; Weston and McKenna,1990; Harris and Anderson,2007). Research also shows that the capacity of railways to carry passengers is influenced by:

a. the length of station dwell times;
b. the separation time between trains;
c. the number of passengers a train can carry; and
d. the number of individual rail cars included in the rail set.

(Kittelson & Associates et al.,2003)

Of all the above it is my view that none of factors b, c, and d have changed substantially over the period during which train performance has been in decline. However station dwell times, as a result of increased patronage will certainly have been increasing.

Ridership growth and to an extent rail service development, has also resulted in an increase in the number of rail services operated over the last decade on both Metropolitan and V/line Passenger Services. This is problematic since rail systems have a finite line capacity and as the number of trains gets closer to the maximum possible, punctuality of services will decline. The Victorian railway network is very complex and prone to significant rail capacity and reliability problems. Many types of trains are operated (freight trains, diesel and various types of electric train) using many types of operating patterns (all, stop express, limited stop) over numerous operating lines that overlap each other.
FIGURE 2 – Trends in Annual Ridership, Punctuality and Reliability Statistics
(2000/2001 = 100)

Ridership 2000/01 = 100

(Un) Punctuality¹ (2000/1=100)

Reliability (2000/1=100)

¹This is the inverse of punctuality i.e. % of trains not on time
This acts to make the network vulnerable to delays and particularly vulnerable to the propagation of delays throughout the system once a delay occurs on one part of the network. A good example is single line rail sections where trains in both directions must share the same tracks. In these situations trains must wait for the track to be cleared where opposing trains using the single line track. When the railway system is delayed such situations act to increase delays throughout the network because trains run out of sequence and fail to meet the required timetable slots so they can use single line sections. The result is further delays.

These constraints are symptomatic of the lack of investment over numerous decades by governments of all types. A punctual and reliable railway operates simple patterns using consistent rollingstock with similar operating characteristics and removes influences of other train operations (e.g. freight). Solving this issue in Melbourne requires a long term investment to standardize and simplify the system.

These issues are also behind the significant problems experienced in early 2009. The cause appears to be the abnormally high temperatures experienced in January and February 2009. This caused track buckling and failure of the air conditioning systems on numerous trains. It is possible to design railway tracks to operate at high temperatures but this has not been a priority for investment in Victorian railways. In particular concrete sleepering and deep pinning of track structures can avoid buckling issues at high temperatures. Unfortunately Victorian rail tracks have not been treated to avoid this issue.

Rail rollingstock air conditioning systems can also be designed to handle high temperatures however it is clear there have been failures with this infrastructure as well. I completely agree with the view that trains need to be withdrawn from service when they have no air conditioning at these temperatures. These trains can carry up to 1,000 people and this can include those who are aged or unwell who might be susceptible to distress if not carried in reasonable comfort. Railways have a duty of care to ensure their services are safe for all passengers.

In this regard I believe there were problems around this issue which should have been addressed in early 2009. I feel there was not enough emphasis placed on informing the public that failure of services was possible (and indeed likely) in many cases. If old and tired infrastructure is not going to work in these circumstances whoever runs the railway has a duty of care to inform the public of the facts. To my view there was too much emphasis placed, particularly in the media, on ‘blaming’ stakeholders for these failures and not enough on giving passengers solid information upon which they could make travel plans. These events were akin to a metropolitan emergency and emergency measures were required to help people deal with them.

An important fact which has not been fully understood is that Victorian rail systems fail every year when there are high temperatures. In my 20 or so years living in Melbourne I have seen consistent withdrawl of service during times of high temperatures however the problems of January and February 2009 were clearly a much worse case. To some extent there is some verification of the consistency of January/February failures over time shown in Figure 1. There are fairly consistent down turns in punctuality and reliability in the first quarter of the year which will be attributable to these problems throughout this data series.

CLOSING COMMENTS

To close I would like to summarise the key points of my submission:
- There are two major failures with Metropolitan and V/Line Passenger rail services
  - The long term decline in performance since 2002
  - The significant issues which occurred in early 2009 due to the heat wave.
- Although much comment has blamed the rail franchisee Connex for many of these problems. I have no information available to me to either confirm or disprove this assertion. However it is a fact that V/Line Passenger and Bayside Trains have experienced the same issues and Connex does not have responsibility for either of these operations.
- Growth in rail demand and lack of investment in rail infrastructure are in my view the principal causes of rail service failures in Victoria
• Removing trains from service due to air conditioning failure is in my view appropriate for safety and duty of care reasons during a heat wave. However for the same reasons, more should have been done to better inform railway passengers of the likely cancellation of services during these times.

To my mind the important lesson to be learned from this is that we need to substantially invest in railway infrastructure to deal with these issues. In particular we need to simplify rail operations and tracks, provide a consistent, reliable and robust set of rollingstock and track network/structure and expand the railway system using principles of simplicity to cater for the substantial growth which is occurring.

An important implication resulting from my views is that the rail system failures identified are likely to continue to occur for some time into the future. Significant investment is needed to address these issues and it will take a period of many decades to implement such investment. To date I do not believe we have hardly started to make investments of the kind necessary to address these issues.

Finally I would like to suggest that there is a poor level of information available to the public about the performance of our railway. It is quite possible that the railway operators were responsible for aspects of the failures identified however no information is publically available to either prove or disprove this. Given that these railways cost the Victorian public many billions of dollars it seems reasonable to me that they should be able to judge the performance of an operator. While some performance data is available this information does not clarify the cause of delays. I am sure that infrastructure quality and the stress associated with ridership growth are a major cause of the problems identified. However I believe more information should be made available so that the public can make a considered judgment of what has happened. It is with this view that I commend the Standing Committee for holding this inquiry. I hope it will go some way to exploring responsibilities for these failures such that they can start to address these significant problems into the future.

Yours sincerely

Professor Graham Currie
Chair in Public Transport
INSTITUTE OF TRANSPORT STUDIES

P.S. I am happy for any of my views to be made public as needed.

REFERENCES