

SUBMISSION

PUBLIC TRANSPORT FARES FOR SYDNEY AND SURROUNDS.

1) KEY FINDING

The recommendations of the draft report are injudicious, technically infeasible, or both. The problem is not only the draft report itself. It's also that the information papers that support it, are informed by, shaped by, and "moderated" (or edited) by a long held, but seriously flawed, IPART perspective.

Although tasked to give attention to fare structures, no reference has been made to alternative fare structures adopted domestically or internationally, with suitability for Sydney.

Fourteen information papers are appended, but none are from expert transport analysts, nor technical smartcard specialists. Thus the two absolutely key areas of enquiry, or research, are unsupported by any specialist expertise. The distortion perpetrated by IPART, commences with the very first paragraph of the first information paper, viz

"integration refers to the way fares relate to each other".

Integration, in fact, means the **exact opposite**. It specifically means **unification**. It specifically means **non-segregation**.

Further, *"integrated fares"* is part of the lexicon of the public transport industry. It has a consistent, standard meaning universally, which is fully at odds with the IPART concoction.

Thus, very much of what follows in the information papers and draft report is underpinned by a seriously distorted starting point.

Adoption of this draft report would be a disaster, technically, financially, and operationally. There is an alternative which not only produces full integration, but delivers a wide range of benefits far in excess of the IPART vision.

2) PREAMBLE

It is very clear that the NSW Government has been keen, for good reasons, to pursue **full** integration of the fares and ticketing system, concomitant with the Opal rollout. On 17 July 15, the Transport Minister was canvassing full integration and stated in a press release that *"I think it is time we recognised that this is the way to go"*. Thus, in his letter of referral to IPART at the same time, eight specific points were detailed, one of which, importantly, was to produce structures "consistent with announced government policy", i.e. *integration*.

Two other referral points reinforced this intention; viz # 1, "to deliver structures to support network integration", and # 3, "to deliver arguments for **full** integration of fares".

Despite tasking which could not have been spelled out more plainly, a report has been fashioned to perpetuate a dysfunctional, non-integrated system, commencing with the IPART definitional connivance; i.e. seeking to portray something that it is not.

WHY THE RECOMMENDATIONS ARE IN NO WAY A MODEL OF INTEGRATION.

"Under our draft decision, Opal fares would continue to differ by mode"

"There would be a separate fare schedule for multi-modal journeys"

"The single mode fare can be charged, if it is higher than the multi-modal fare"

“The long trip rule applies to bus multi-trip journeys, but does not apply to train multi trip journeys”

“Fares differ in the peak and off peak periods for rail only”

“The multi-mode fare for ferry and other mode, is different to bus and train, and other mode”.

“Peak times for Trainlink are different to Sydney train”

These truncated examples of many more which are not listed, illustrate a ***non-integrated*** structure and it is humbug to label the Report “more integration”, to give the appearance of compliance with the Ministerial referral.

Of the ten or so measures necessary for integration, the draft report only deals with one of them, but, even then in a way which won't work, as below.

This suite of inconsistent, variable and contradictory business rules will have major repercussions in the technology area (see Item 9).

3) WHY IS IPART SO TOTALLY AVERSE TO FULL INTEGRATION?

The answer lies in the Information Paper, in which it is asserted that,

“equalising fares across modes and keeping cost recovery constant would mean that fares for bus would have to rise and fares for ferries would have to fall”.

This would only be so if relying on pre-existing charging methodologies, such as distance travelled, or point to point distance. But in an integrated system, fares would simply not be calculated in this way. There is another option for ferries. There is a totally different framework, totally different structure, totally different methodology (not even recognised by all these studies and papers), in which outcomes would be produced that were entirely equitable, and better aligned to other objectives.

And no effort is made, seemingly, to understand the benefits of full integration, especially in terms of beneficial externalities.

IPART has a blind spot on this. And, because of it, the whole exercise is steered down a path of on-going dysfunctionality.

4) WHAT DO THE STAKEHOLDERS WANT?

It is clear, from the Referral that the Government seeks full integration.

From the Morgan surveys, the majority of PT users supported the proposition that “fares for the same distance for all modes should be the same” (i.e full integration). So, the travelling public want it. All taxpayers would also want it (transport users or not) when cost recovery benefits are set out. There isn't a single stakeholder group which doesn't support integration. So, the only thing standing in way is IPART's lack of comprehension as to how to achieve it.

5) DISCONNECTS WITH ASSESSMENT CRITERIA AND MATHEMATICAL MISCALCULATIONS.

Sydney has a fare box recovery of 20.8%, close to the worst performing comparable cities in the world.

One of IPART's assessment criteria, is quite correctly, "increase fare box revenue or cost recovery. To say again, **"INCREASE FARE BOX REVENUE"**.

Even the CIE study on costs finds room to remark that "mechanisms to attract revenue within an **INTEGRATED FARE SYSTEM**, could usefully be improved". Quite right. They can.

Extraordinarily, IPART is projecting revenue increases. The question of "How" is impossible to figure out. In revenue projections, it is stated that "revenue is calculated by multiplying patronage by ticket price". Now, negligible patronage growth is factored in. So, on IPART's predictions, it doesn't come from growing the business. But the report is saying that fares **for 60% of riders will drop by as much as 20% to 50%. (Average 35%)**.

So, for example, let's say: BEFORE: 100 riders @ \$4 = \$400. AFTER: 60 riders less 35% @ \$2.60 = \$156. This would mean that for the 40% who do not get a fare reduction; their fares would need to rise to \$6 each, just to break even. That is, a 50% increase. The calculations cannot be right.

But in what can only be viewed as a monumental lapse of judgement in both the Media Release and Draft Determination, IPART pronounces that 60% of travellers will **pay less**. Now, IPART is the Government's Economic Advisor. How can it be that you satisfy the objective of increasing fare box revenue, by charging 60% of travellers 20 to 50 per cent less? Well obviously, you cannot.

Red lights should have been flashing. Alarm bells should have been ringing. An immediate re-think should have come into play, when confronted with such an anomalous and unacceptable outcome. Yet not only has it been published, many **specific examples** have been quoted, which will quite naturally raise expectations of this outcome. It was a seriously premature action.

6) FARE CHARGING METHODOLOGIES.

Until the release of this draft Report, there were three known and widely adopted fare charging methodologies around the world:

- (i) Flat Fare
- (ii) Distance Based
- (iii) Zonal.

Now, it is recommended that there be a fourth, viz "straight line point to point". Sydney, alone in the world, would go down this path. If it has ever been considered elsewhere, it has been rejected, for very apparent reasons, viz, that fares, according to IPART, are reduced for 60% of travellers. At a time when revenue is a major issue.

To look at these alternatives:

- (i) Flat Fare. This is the domain of North America, where mass transit runs a distant second to private motor vehicle use. These systems are simple and comparatively inexpensive to operate, but have a low fare-box recovery ratio. If substantial investment in PT was ever to occur, it is likely that flat fares could not be continued. Examples include New York; Boston; Chicago; Dallas; Los Angeles; Portland; San Diego; and Atlanta; and in Canada, Toronto, Ottawa; Montreal; Edmonton and Calgary.
- (ii) Distance Based Fares. This is the domain of Asia, where although patronage is high, the geographic area is small, travel is heavily CBD- centric, (as opposed to cross town), and is of short distance. Examples include Hong Kong; Singapore; Osaka; Tokyo; and Taipei.
- (iii) Zonal. This is the domain of Europe and Oceania. Typically, governments foster mass transit and invest heavily in it. Examples include London; Paris; Berlin; Munich; Madrid; Stockholm, Seattle, San Francisco; Auckland; Christchurch; Dunedin; Wellington; Brisbane and Melbourne.

Best practice in research would mandate that all such methodologies be examined and evaluated for relevance/suitability for Sydney. There is no evidence that IPART has had any regard to systems from which Sydney could learn, and profit. There is no doubt whatsoever that Sydney aligns most closely

with group (iii)(Zonal). And yet, IPART does not even devote a single word to the most obvious solution, which, critically, would also provide the key to full integration..

Instead, on Page 68 of the report, IPART states that “we agree with submissions that fares based on distance travelled are more efficient.” The question is, more efficient than what? “Efficiency” is a measure of productivity, or reliability, or process, can only be part of the fare equation, and cannot disregard equity as a primary consideration. In any event, although IPART “agrees with” distance travelled charging, it does not, ultimately, recommend it.

Flat fares:

In a city like Sydney, which is so geographically vast and where commute distances can be long, flat fares could never be a solution. A flat fare could never be fashioned to satisfy revenue and equity prerogatives.

Distance based fares:

This methodology only works well, when distances are not great, routes are not circuitous, and travel is primarily to/from one focal point, e.g Hong Kong, where the key attractors are Hong Kong Island and Kowloon. It is why it is so well suited to Asia, but ill-fitting elsewhere. And therefore, rejected. It does not align with Sydney at all. One would think that a fair degree of expertise lay with the transport planners of London, Paris, Berlin and Munich etc, who, with their massive investment in mass transit, have a fair incentive to get it right.

It is totally inappropriate for Sydney, which is challenged by difficult physical characteristics, especially the vast harbour, and where many, if not the majority of bus and rail routes are circuitous, most probably reinforced by the bus contract structure. To give but a few examples of circuitous routes:

- (a) The 136 from Manly Wharf to Chatswood Station, via North Manly, Freshwater, Curl Curl, Dee Why, Beacon Hill, Frenchs Forest, Roseville and North Willoughby.
- (b) The 415 from Campsie Station to Chiswick, via Belmore, Belfield, Enfield, Strathfield, Burwood, Five Dock and Abbotsford.
- (c) Train travel from Killara to Denistone via Turramurra, Waitara, Hornsby, Thornleigh, Epping and Eastwood.

Such routes penalise travellers being charged for the distance travelled. IPART terminology, such as “economic”, or “socially optimal” cannot disguise, nor justify the plain unsuitability of this methodology.

Unless routes follow a very straight line, which typically they don’t, there is nothing socially optimal about charging for distance travelled. Although, supported by IPART, this approach is not the recommendation, which is for “straight line point to point”.

Straight line point to point:

As much (as above), “distance travelled” has high risk for serious inequity, “straight line point to point” is absurd for Sydney and its environs.

Case Study #1. Chowder Bay to Watson’s Bay.

What is being proposed is that Travel from Chowder Bay, via Mosman, North Sydney, Harbour Bridge, CBD, Eastern Suburbs to Watson’s Bay, is cheaper, than travel from Chowder Bay to the CBD.

Case Study #2. Birchgrove to Balls Head Reserve.

What is being proposed is that travel via Pyrmont, CBD, Harbour Bridge, North Sydney and Waverton, is cheaper than Travel from Birchgrove to Lilyfield via Balmain..

Case Study # 3. La Perouse to Kurnell.

What is being proposed is that travel via Mascot, Bexley and Caringbah, is cheaper than travel from La Perouse to Mascot.

Case Study #4, Re BOX 22. Kensington to Bankstown.

What the report is telling us, is that travel from Kensington to Bankstown, via Central Station, is the same price as Kensington to Central. Seriously??

Case Study #5 Waverton to Woolwich.

What is being proposed is that travel via Milson's Point, Harbour Bridge, Town Hall, Pyrmont, Rozelle, Drummoyn and Hunters Hill, is cheaper than travel from Waverton to Town Hall.

Case Study #6 to 1000.

I will not detail these. The proposal has at least this many serious anomalies and inconsistencies.

This methodology is clearly not logical for Sydney. Not predictable. (Travellers will not have access to Google Maps distance calculator) .Inequitable. Full of contradictions and anomalies. Harmful to cost recovery. Worst of all, it is potentially "undoable" for multi modal trips (see below). It fails multiple tests on the so-called IPART "Objectives".

Neither distance travelled nor point to point (the only options canvassed) will give an outcome which works, and meets the stated objectives. Only a zonal system will do this. The only model that works has been completely overlooked. And in so doing, the one solution leading to full integration has been missed.

Under the IPART solution, Sydney, alone in the world, would not have its central CBD in a single fare zone.

7) COST BENEFIT ANALYSIS.

The Ministerial referral calls for a cost/benefit analysis.

In response we get a 112 page document on costs, but not a single word on benefits. So, I will deal with benefits separately..

What is true is that cost recovery has an important equity dimension, insofar as those who consume services should contribute to their costs.

Equally, cost recovery contributes to fiscal sustainability.

Beyond that, talk of "allocative efficiency", and "marginal cost" and "aligning service price to cost of production" etc; true as it may be, doesn't really help us that much in the mission here. Because we will never get down to allocative efficiency and marginal cost.

Moreover, a "profit and loss statement" approach is equally suitable in comparing the relationship of costs and revenue to net benefit. A "gross profit" methodology will measure efficiency just as accurately, by showing how efficiently an enterprise is managing cost centres, such as materials and labour.

There is a heavy focus of costs as a measure of economic efficiency. However, the Consultant himself points to two over-riding realities, which render most of the work of little use.

- (i) “many services are provided for reasons of social equity rather than efficiency”.
- (ii) “outer metro areas (not specified as to what is outer, or how many)) should **not be included** in costs for setting fares”.

Exactly. There are so many exceptions, special cases, unique circumstances, historical practices etc, that fare setters are **NEVER** going to be concerned about allocative efficiency, and the rest of it. As for “socially optimal”. A waste of paper. No fare setting practitioner would go down the IPART path, (if it could be understood). What would be definitely sought is “optimal”, being the point of maxim patronage at highest levels of revenue. That is the target.

8) BENEFITS

The benefits of a fully integrated system are vast.

To highlight how deficient and inappropriate the IPART research methodology was, it states that (in respect of its preferred structure) , “patronage projections were only modelled on a single mode basis”. Either this was a deliberate attempt to disguise the benefits of integration, or a plain lack of understanding as to what to research.

Because, extensive data is available from multiple systems which show a minimum 5%-8% patronage growth from full integration. With **no exceptions**. Growth in PT (or, a mode shift from car use), links to many direct and indirect benefits, more so with smartcard technology.

- Higher fare box. Greater cost recovery.
- Better bus fleet utilisation
- Reduced fare evasion on rail with higher cost recovery.
- Cleaner air, which flows to public health benefits, health care costs etc.
- Less pollution
- Less road congestion. More efficient freight performance.
- Faster trip times.
- Lesser dwell times
- Lower petrol usage; energy conservation
- More money in smartcard bank
- Commercial property value of transport hubs and corridors.
- Significant impact on land use development and population density.
- Beneficial impact on local economic development.
- And, most significantly, the avoidance of huge system administration costs of a non-integrated system. (see below)

Why wasn't CIE tasked to quantify direct benefits and beneficial externalities? After all, under Referral # 3, IPART was tasked to “deliver arguments for full integration of fares”. Where are these arguments? No information paper on the most central point of integration.

9) TECHNICAL FEASIBILITY AND LIMITATIONS.

IPART was specifically directed to address these points, and, taken at face value, it has not. No Information Paper. Not a single Section or paragraph, nor indeed a single word has been included. This is the most important point of all. Because, if proposed measures are technically infeasible, or prohibitively costly, or unacceptably time consuming, then they are more or less worthless, if “it ain't going to happen”.

I must start this Section of my response with the disclaimer that I am not a technical expert, and these observations should not be read as such. They should be viewed as a first pass risk assessment stemming from substantial experience of smartcard business processes and a working knowledge of hardware and software.

It is not possible to grasp the technical complexity and difficulty of what is proposed, without a basic grasp of the inner workings.

Before coming to some specifics, can I begin with generalities? We are dealing with a complex environment here. To minimise risks, it is essential for business rules to be condensed, logic to be precise, anomalies ironed out and exceptions eliminated. The smallest change can have major repercussive impacts, which need to be recognised. Take, for example, the TfNSW “trip planner” and “Fare Calculator”. When you run the five cited “point to point” examples through the “calculator”, it will not produce the correct Point to Point fare. It does not recognise four of the bus trips as being 0-3 kilometres. Indeed, for the La Perouse trip, it produces a fare of \$8, which is not even in the fare schedule.

Why would this fundament failing occur? Presumably, because the system software has no way of knowing the point to point distance. (This point is amplified below). It simply finds the shortest bus routes, calculates the Sections, and marries the answer to the distance travelled schedule. And comes up with the wrong answer. As we see below, point to point relies on AVL. A couple of years back, TfNSW advertised a new technical officer position, to deal with “AVL not working correctly”.

Just to redouble the note of caution on technology risks. Above, we have the example of “the AVL not working”.

In the CIE costing report it is noted that “STA has been unable to provide patronage data since Opal was introduced”. There are two key data sets an AFC must produce, viz revenue and patronage. And yet, the system can’t produce it. These things are the lynchpins of the system; AVL and the patronage data. And they don’t work.

Now, this will be ironed out and brought up to scratch. But, it illustrates the huge risks of system failure. Bear this in mind as we move on to the issues illustrated below.

From a risk assessment perspective, can I set out just a snapshot of issues which would need detailed analysis by competent IT smartcard consultants, in conjunction with the Contractor. (Cubic). To try to step through the issues in some sort of logical sequence:

(1) Hardware.

- Point to point fare calculation relies on precise distance calculation
- This would be made possible if all modes were GPS enabled. But, they are not.
- AVL is a bus only system.
- AVL is dependent on hardware.
- The on-bus platform includes GPS capability through the driver control unit.
- So, for bus only trips, a point to point fare is technically feasible, but subject to many provisos, as below.
- Rail hardware has no GPS capability. It is designed for a stationary point.
- Gated stations have been retro-fitted to smartcard capability.
- TfNSW technical note O44 makes no provision for Station GPS.
- The 6100 series validator has no GPS capability.
- GPS cannot work for Stations which are underground or, under buildings, e.g City Circle, Airport, North Sydney etc.
- For these stations it would be necessary to install Microwave Links and repeater stations.
- So, the hardware, if the system is to be GPS based (as per AVL) does not exist for rail.

- For rail GPS, a massive system upgrade would be required, if it was possible at all.
- If not GPS based, then what?

(2) Software

- To calculate point to point, the system needs to know the points of tag on and tag off.
- For bus only, it will know this from GPS and AVL.
- Rail fares are calculated from track distances measured between Opal activated stations. (Refer Opal web-site)
- To do this, there must be a measurement matrix, with a pairwise - distance algorithm.
- But, for bus/rail, there would be no way of calculating point to point distance; UNLESS
- A distance measurement matrix was established for all pairs, i.e every single combination of distances from every bus stop, to a specific railway station.
- This process would need to be repeated for every single railway station.
- That is, potentially millions of combinations.
- The hardware reads the card, calculates fare, deducts fare and re-encodes remaining value.
- To do this it carries files (fare tables), business rules, processing power, memory, ram, eeprom etc.
- To follow the IPART recommendation ,the devices must now carry six or seven fare tables; viz mode specific, multi modal, off peak, Saturday & Sunday caps, opal gold, gold weekend, etc etc
- It must carry the distance matrix of hundreds of thousands (or more) of point to point distance calculations.
- And it must carry a plethora of often contradictory business rules.
- A guaranteed recipe for disaster.

(3) Computational iterations.

Again I claim no expertise and have no access to CUBIC IP inside the box. I apologise if what follows is not precisely right, but the general principles are.

- Within the operating system there are data, such as fare tables and business rules etc
- If during a transaction, the data needs to be classified against one criterion, it is a simple process.
- When there are multiple fare tables and extensive business rules, the classification, or determination of the correct end result, is more complex.
- As variables are in play, it is necessary to scan subordinate cells to reclassify the data.
- And, this needs to be done again, and again, according to the next criteria..
- For multi-modal trips, the software must now perform extensive iterations instead of one or two, before it reaches an answer.
- It must calculate the mode specific fare. (From table and AVL or distance matrix)
- It must calculate the integrated fare (from table and distance matrix).
- It must calculate if a mode specific fare is greater than the integrated fare (as per example Box 22).
- If it is not, it must go back to the integrated table.
- If it is, it must disregard the integrated table and revert to the mode specific table.
- It must link to the time clock and determine if the time is "off peak" for rail.
- It must then revert to either the peak, or off peak table.
- It must establish if the day is Saturday or Sunday.
- If yes, it must calculate the fare from the weekend tables.
- If over \$7.20 it must disregard all previous calculations and charge \$7.20
- If not, it must return to start point and start again.

- It must total fares in a defined period and measure total against \$65 ceiling.
- If over, disregard steps 1-12 and charge nil.
- If under, restart process.

That is, twelve variables and iterations to this point. And there are more. I have not yet started on all the differences in gold cards and concession cards, with 30% rates and 20% rates etc etc. The precise sequence of the illustration. i.e the “process sequence” and “command sequence” may work differently. But it accurately paints the computational picture.

10) CAN IT WORK?

There is a very serious doubt.

These linkages, or cell strings, greatly increase memory needs and processing power. The capacity of the current devices is known in specification terms only. For example, the Cubic Station Validator has 256 k SRAM (static random access memory) and 8 mega bit (MB) flash embedded memory.

-A hugely important, pivotal, game breaking question, is whether the devices have the scope (memory, ram etc), to handle the additional computational work load, at a speed (< 50 milliseconds) which does not compromise passenger flow. There is a real doubt that they do.

In Melbourne with the MYKI system, poor response speeds meant that more gates and devices were necessary to reduce bottlenecks.

To minimise risk and improve “doability”, business rules have to be absolutely precise, succinct, unambiguous, exception free.

But, the business rules, as articulated at present, are anything but. They are neither precise nor consistent. They are voluminous. .It is a recipe for big trouble.

This list of dot points is merely the starting point of a rough cut, first pass, layman, risk analysis. No doubt, it lacks technical sophistication. But.

There is enough there to raise flashing red lights. On its face, it appears that the proposed system is either technically infeasible, or would be hugely time consuming in terms of hardware, software, development testing etc.

The risk analysis verdict is **huge risk**. To be re-assured, it would be necessary to see a prototype, or test, in action (the development time for which is unknown).

On these grounds, it would not be the way to go. And, luckily, it is not the right solution.

11) SYSTEM OPERATION COSTS.

The costs of implementing recommendations should not be underestimated. At contract award, the projected cost was \$1.2 billion. The appended Consultant Report noted that “costs show a significant increase from estimates”, which will always be the case for scope change, variations, and muddled business rules. The report also states that “costs will substantially decline from current levels”.

You should believe that when you see it. That is, it’s dubious.

System costs increase commensurate with complexity. This Item should be read in conjunction with Item 9.

Dependent upon clarification of technical issues, system costs could rise by **tens of millions of dollars**.

The equation on the value of full integration, needs to factor in the savings arising from the proposed costly non-integrated solution.

The report has a massively skewed emphasis on costs, and observations that proclaim “policies that reduce costs increase efficiency”. As they do. But the potential for massive costs associated with the draft template are not mentioned. This is but one of many inconsistencies of purpose and logic.

12) THE SOLUTION.

The solution is set out in the Appendix.

The Solution.

- Will Be implementable
- Will take Sydney out of the 3rd world ticketing systems
- Will be elevated to World Best Practice
- Will save tens of millions (at least) of system costs.
- Will avoid long delays of implementation.
- Will stop Sydney being a laughing stock
- Will avoid contract disputation, aggravation and (scope for) litigation
- Will deliver far better cost recovery than the IPART proposal.
- Is in accordance with Public preference and government policy
- Will deliver minimum 5 % patronage growth.
- Will foster beneficial externalities
- Will be coherent, simple, user friendly
- Will maximise benefits from a massive financial investment.
- Will minimise on-going operational costs.
- Will require nil equipment upgrades.
- Will be easy to support on information web sites.
- Will be fair and equitable, with any fare increases to fit within IPART maximal
- Will better sustain on going investment in mass transit, BUT.
- Will **not** deliver reductions of 20% - 50% to 60% of travellers. (That magic pudding does not exist). (Achieving sustainability is not that easy).

13) SUMMARY.

There is not “more integration” in the draft report. Of the multiple measures necessary to achieve integration, this report proposes only one, which cannot satisfy objectives and must be discarded. Effectively, nil integration measures.

This leaves Sydney’s transport ticketing system as shambolic and dysfunctional as it has been for decades. The opportunity to maximise benefits from a huge investment has been squandered. Again.

There are no structures to support network integration. No arguments for full integration of fares. No consistency with announced Government policy. No benefit/cost analysis. No assessment of technical feasibility or limitations.

The IPART announcement of its findings, based on faulty assessments, was premature and harmful.

Very little of the Report has credence for a solution which will deliver Sydney everything it seeks.

Bob Lutherborrow

APPENDIX

SOLUTION TO INTEGRATED FARES AND TICKETING FOR THE GREATER SYDNEY REGION.

KEY FEATURES.

- A single, fully integrated system
- Fares to be based on **Zones**, and the principle of “zones travelled through”.
- A journey may consist of single mode trip, multiple trips on single mode (e.g bus/bus), or multi-mode trips (any combination). The business rule on interchange to be developed.
- An outline of an abbreviated zonal modal is attached.
- Fares for rail, bus, light rail and ferry to be identical. In every respect.
- Fares for Airport railway stations to incur a “station access surcharge”
- Fares for ferry to incur a “wharf access surcharge”.
- “Peak” and “Off Peak” definitions and times to be totally uniform. No exceptions or differences.
- The only options will be peak and off peak. No other. (No “night riders” or “weekend shoppers” etc).
- There will be four types of Opal cards only.
 - (i) Adult
 - (ii) Concession. 50% of Adult Fare. Pensioner; Senior; Apprentice; Job Seeker; Asylum Seeker.
 - (iii) Free. Veteran; Vision Impaired; Vision Companion.
 - (iv) School Child. 50%. All School children from age 4 to 18. Note. A 17 and 18 year old, not at school, is an Adult.
- A “Sunday” product, if implemented to be uniform to all classes.

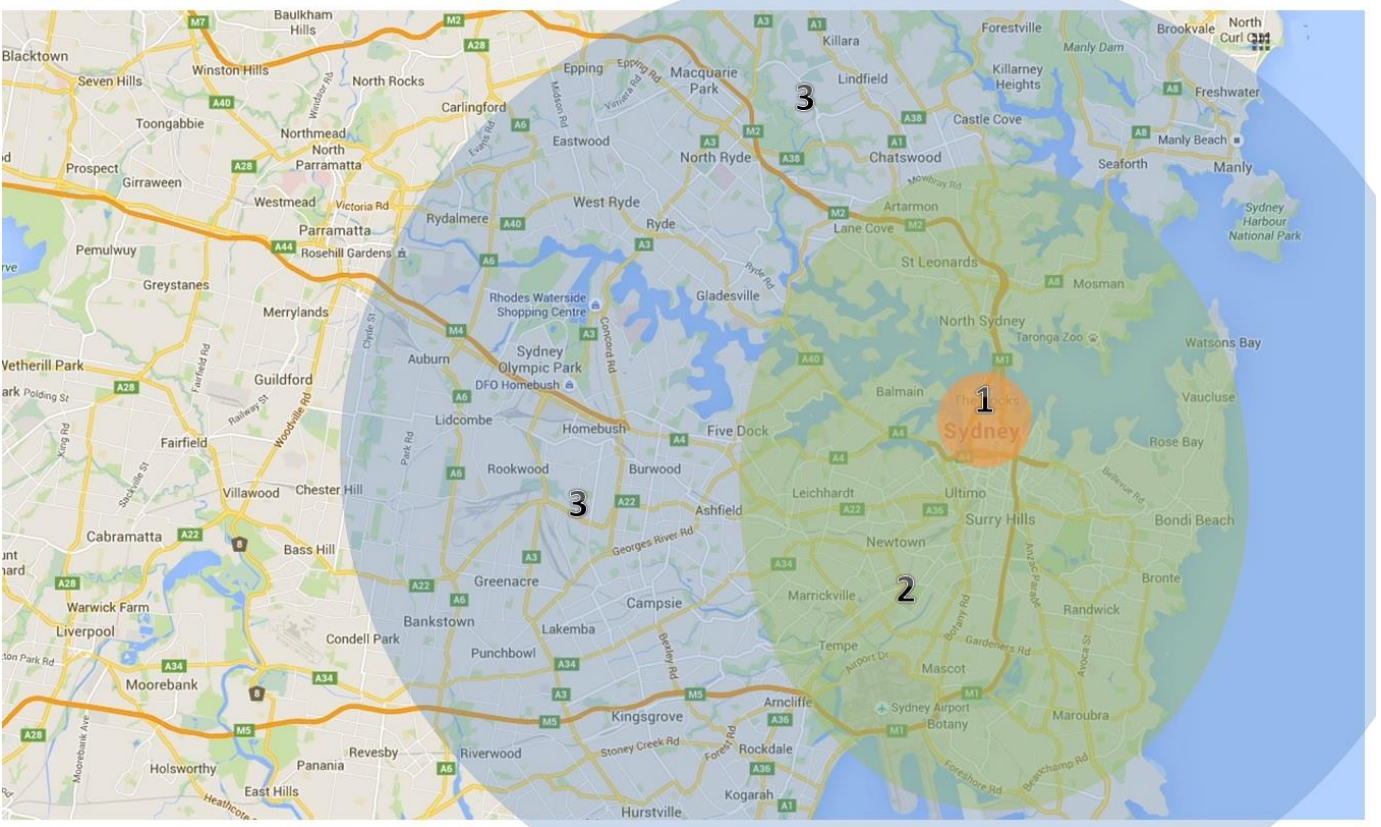
NOTES ON BUSINESS RULES.

- (i) Assisted school travel to lie outside the Opal framework. School children will be issued a pass, as now, to travel free, or, on a term discount pass. Or, if using a bus run by an Independent school, to align with school rules. The “proof of payment” will be possession of a pass. Nothing changes with the pass system. But it doesn’t translate to an Opal card.
- (ii) When School Children are not on a school bus, or are not travelling to/from school, they will use their “School Child” Opal Card. The rules, eligibility etc on school children do not change. “Proof of eligibility” e.g on age grounds will mainly be an issue for 17 and 18 year olds. Requirements for “proof” don’t change.
- (iii) The Fast Manly Ferry to lie outside the Opal system entirely. All private transport services; shuttle buses; courtesy coaches; sightseeing excursions etc to be excluded.
- (iv) The wharf “access surcharge” will be a set, standard rate.
- (v) The various “passes”, “permits”, “entitlement cards”; “concession entitlement cards” etc will be eliminated. The rules on entitlement will remain unchanged. However, the application and issuing process will be streamlined and contracted. There will not be a dual Opal and permit/pass system; except for school travel.
- (vi) Trainlink has not yet been examined.
- (vii) Tertiary Students has not yet been examined.

NOTES ON ZONES.

- The placement of Zonal boundaries is an exercise of “best fit”

- In very broad terms, it is likely to roughly examine concentric rings. But they will be neither rings, nor concentric.
- A wide range of considerations apply. Equity, consistency, attractiveness, ease of understanding, revenue outcomes, moderation of anomalies etc.
- On the face of it, it may appear that very long distances can be travelled for, say, a single zone fare. But, Transport routes do not typically follow an “outer ring road” track, and typically for such journeys it is necessary to traverse multiple zones.



ABBREVIATED ZONAL MODEL

