VICROADS ASSOCIATION NEWSLETTER NO. 279 April 2026

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Membership of the Association is available to all who have been members of VicRoads or forerunner organisations or the spouse of deceased members and bestows on them all the rights of the Rules of Association. Cost of membership is a once only fee of $50. Enquiries about membership or receipt of the Newsletter by e-mail should be directed to the Secretary, VicRoads Association, by phone or e-mail as shown above. Visit our website at https://vicroadsassociation.org

Dear Members

I have included this lovely picture[1] of a past autumn in Honour Avenue Macedon in anticipation of leafy glories yet to come, and as a welcome, if short-lived distraction from the global oil, gas, helium and fertiliser supply crisis that is threatening big changes to the way we live.

One of the more questionable benefits of being in advanced years is having clear memories of the past and realising how often history sadly manages to repeat itself. It doesn't seem all that long ago (in fact, it was 1974) that Australia hosted a State visit by Mohammad Reza Pahlavi, the Shah (Persian for king) of Iran and his lovely wife Farah, the Empress.

The splendidly uniformed Shah made no secret of the fact that he ruled one of the most powerful military forces in the Middle East, and I think many of us were quietly pleased that Iran's oil was safely in the hands of somebody who was not allied to the Soviet Union

[1] Courtesy of Things to do in Melbourne with Kids website 24 Best Places For Autumn Leaves Melbourne 2025 .

and China. In 1974, most of us had either forgotten or (more likely) had never heard about what had happened in Iran in the early 1950's.

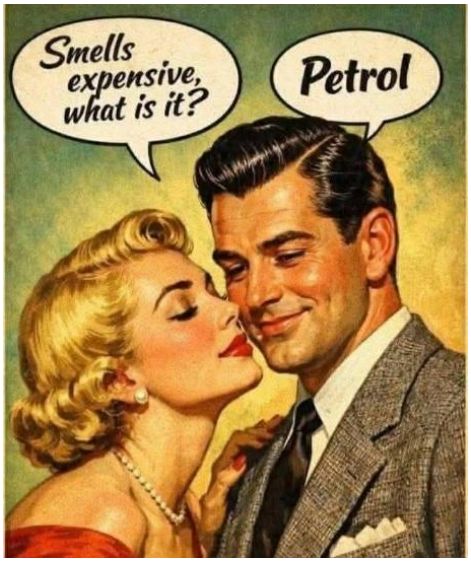
In 1951, the Shah was Iran's reigning monarch in a role not dissimilar to that of the monarchy of Great Britain. A newly elected Iranian Parliament led by Prime Minister Mohammad Mosaddegh sought to audit the books of the Anglo-Iranian Oil Company (AIOC - now BP) over concerns it wasn't paying its contracted loyalties, and to limit its control of Iranian oil reserves.

When the AIOC refused to cooperate, the Iranian parliament voted to nationalize Iran's oil industry and to expel foreign corporate representatives from the country. The then British Prime Minister, Clement Atlee[2] opposed demands for a direct military response using British forces and instead instigated a worldwide boycott of Iranian oil. Production from the other British controlled oil fields was increased to make up the shortfall - reducing Iran's revenue from its oil sales by 96%.

A more hawkish Winston Churchill, who replaced Atlee in 1951, was determined to regain control of Iran's oil fields and in early 1953 solicited the Eisenhower administration's help in overthrowing[3] Iran's government. A military government was installed with the cooperation of the Shah, who was given considerably more power in the running of Iran. Britain agreed to share Iran's oil on a 50/50 basis.

In 1979, the Shah's government was overthrown in a popular revolution and Britain lost its Iranian oil income forever. Now, the efforts of the USA and Israel in trying to overthrow the current government of Iran has raised the spectre of fuel rationing in Australia.

Back in 1979 the restriction of crude oil supplies arising from the Iran revolution, coupled with prolonged industrial action by refinery workers at Caltex Kurnell in Sydney resulted in Australia's first official fuel rationing since World War 2.



To manage the shortages, the government decreed that consumers could only buy fuel every second day, with rationing based on car number plates – those ending in odd numbers could fill up on odd-numbered calendar days, while number plates ending with an even number on even-numbered calendar days. I'm not sure how plates with alphabetic characters will be treated if rationing is reinstated.

Back in 1979, Australia produced 70% of its petroleum needs, so we weren't in real trouble. Now, Australia imports 90% of its liquid fuel requirements. I suspect that if rationing returns it will be around for somewhat longer than a few weeks.

[2] Some commentators believe that Atlee, who introduced major socialist and nationalisation reforms in Britain after the War, may have been sympathetic to Mossadegh, who had attempted to introduce similar reforms in Iran.

[3] It was to be the first of many coups engineered by the CIA to overthrow foreign governments and install administrations more sympathetic to the USA. Interestingly, Eisenhower strongly opposed Britain and France's attempt to retake the Suez Canal in 1956, after Egypt's leader, Abdul Nasser nationalised it.

WHATS COMING UP?

Our 2026 event calendar

Date	Event	Contact Person
Wednesday 27 May	Tour of the Traffic Operations Centre, 110 Maroondah Highway, Ringwood followed by lunch at the Ringwood RSL	Allison Pinto Allison.pinto@hotmail.com
Monday 1 June	12 noon for 12.30 pm Occasional Lunch, Doncaster Shoppingtown Hotel	Just turn up
Monday 29 June	12 noon for 12.30 pm Mid-year lunch at the Ringwood RSL (Please note the change, as the Glen Waverley RSL has been destroyed by fire)	Ken Vickery kenvickery@tpg.com.au
Wednesday 15 July	Presentation and tour of the Alstom Dandenong site. Tour will be preceded by a lunch at the Dandenong Pavillion Hotel.	Jill Earnshaw jillmearnshaw@gmail.com
Monday 4 August	12 noon for 12.30 pm Occasional Lunch, Doncaster Shoppingtown Hotel	Just turn up
Mid-August	Regional visit – Geelong including TAC presentation and potential visits to a local factory, Port of Geelong, etc.	Jill Earnshaw jillmearnshaw@gmail.com
Monday 7 September	Visit to the Shepparton Art Museum (SAM) to see the *Facing Modernity: Degas to Picasso* visiting exhibition and the Archibald Prize Exhibition. Starts 12 noon with lunch at the SAM Café.	Jim Webber jameswebber1717@gmail.com
Monday 5 October	12 noon for 12.30 pm Occasional Lunch, Doncaster Shoppingtown Hotel	Just turn up
Friday 30 October	Annual Golf Day at Green Acres Golf Club, Kew East	Jim Webber jameswebber1717@gmail.com
Monday 9 November	12 noon for 12.30 pm Occasional Lunch, Doncaster Shoppingtown Hotel	Just turn up
Monday 8 December	11.45 am for 12.30 pm Christmas lunch at a new venue, to be advised. (The Glen Waverley RSL is no longer available due to a major fire).	Ken Vickery kenvickery@tpg.com.au

Traffic Operations Centre Tour at Ringwood 27 May 2026

Back in 1992, when I was Reg Patterson's Technical Aide, he asked me to show two visiting senior American Department of Transport officials over the Traffic Operations room in Camberwell. It was my first visit also, and we were all spellbound at the multiple

screens fed by an incredible network of cameras, and the controllers' ability to quickly appreciate and take necessary action on any reported traffic problems.

In July 2018, VicRoads Association Members and friends visited the VicRoads Traffic Control Centre in the basement of VicRoads Head Office in Kew. It had been relocated there following the closure of the Camberwell Centre. Amongst other things, we enjoyed a privileged, firsthand glimpse of the workings of the Freeway Management System and its automated incident response arrangements.

With the closure of the Kew Head Office in 2023, the control room, now titled the *Victorian Traffic Operations Centre* was relocated to a brand-new commercial office in Ringwood. It is in the dark building at the left of the picture below.

Our visit on 27 May will suit members planning to travel by public transport (given the fuel situation, we might *all* be travelling by public transport), as the Traffic Operations Centre is located just north of Ringwood Station, which is also a major bus interchange.

For those arriving by car there will be adequate parking in the grounds of the Ringwood RSL, where we will be having lunch following the visit. The RSL, not visible in the picture, is located on Station Street at the bottom of the picture, immediately south of the Station.

Because of the physical size of the Traffic Operations Centre, the maximum group size per visit is 15. We are anticipating a larger group and are proposing two visits – one between 10 and 11 am and another between 11 am and 12 pm. Depending on the actual numbers attending, we may revise these arrangements closer to the day.

If you would like to attend, please email Allison Pinto on Allison.pinto@hotmail.com to register your interest and also let her know if you will be having lunch at the RSL.

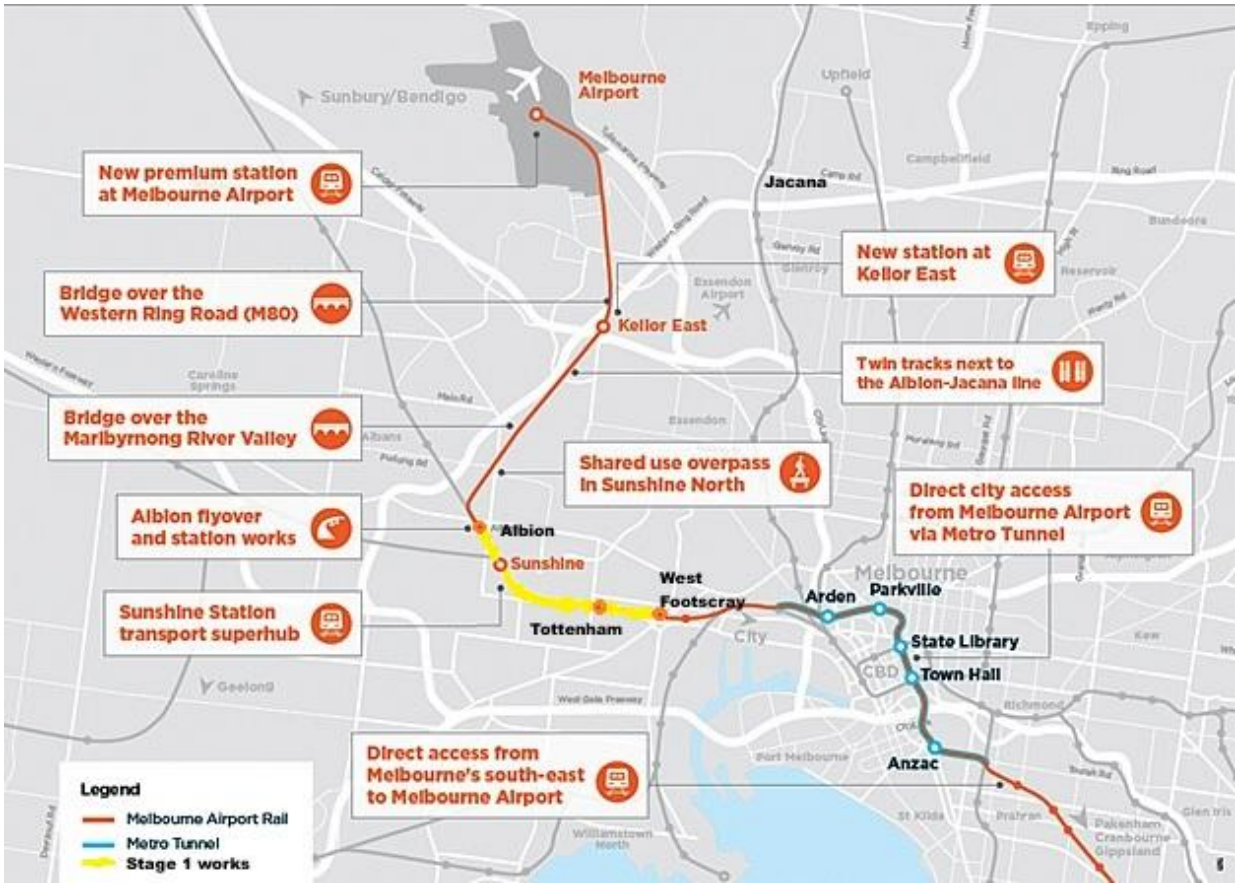
WHAT'S BEEN HAPPENING?

Sunshine Rail SuperHub presentation – by John Wright

On 31 March, twenty Members and friends visited the Southern Cross Building in Exhibition Street, Melbourne for a presentation by the Victorian Infrastructure Development Authority (VIDA) on the Sunshine SuperHub.

The presentation, which was actually entitled *Melbourne Airport Rail Stage 1,* was facilitated by Renee Shankar, VIDA Manager Stakeholder Relations and Communications, and delivered by Andrew Pepplinkhouse, VIDA Rail Program Director (both ex. VicRoads). We discovered that the Sunshine SuperHub is only a part of a massive, $4.1 billion Stage 1 project extending from West Footscray to Albion.

Because the presentation did not discuss the full scope of the Melbourne Airport Rail Loop (MARL), I have taken the liberty of briefly describing it so that readers might better appreciate how the Stage 1 works fit into it and why they are being constructed now.



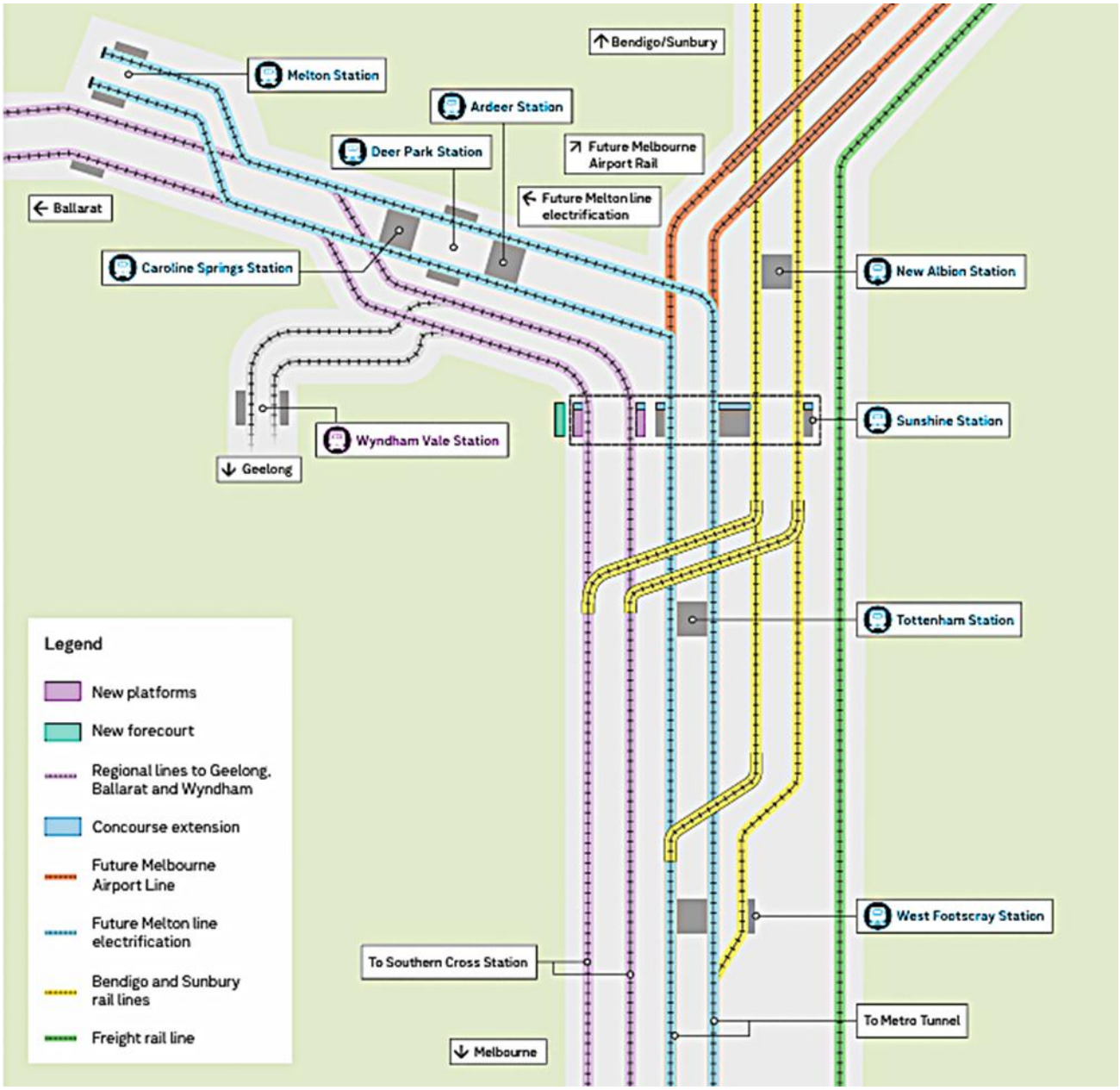
Some of us may not be aware that part of the 'new' airport rail route already exists as a non-electrified freight and standard gauge interstate passenger rail corridor between Albion Station and Jacana. It was built in the late 1920's so that freight trains could avoid steep grades and busy suburban traffic on the Craigieburn line via Essendon.

The new airport line will share the freight line's reserve beyond Albion but will not use its tracks. New, twin tracks, including a new, high level bridge over the Maribyrnong River will parallel the freight line as far as Keilor Park, where a new station will be provided at Keilor East. The MARL tracks will then swing away to the north towards the airport on another new viaduct across the Western Ring Road.

As the section of MARL between Albion station and the Airport is a future stage, Andrew's presentation of *Melbourne Airport Rail Stage 1* was focussed on the 6 km of major facilitation works between West Footscray and Albion stations.

If the future airport rail service is to function effectively, with trains running every ten minutes, the complex web of rail lines between West Footscray and Albion must firstly be upgraded and literally untangled. It is probably fair to state that, even without the Airport Link, the First Stage works are already an urgent requirement to accommodate the growing passenger and freight demands on the Geelong, Ballarat, Bendigo and Sydney lines that all pass through Sunshine Station.

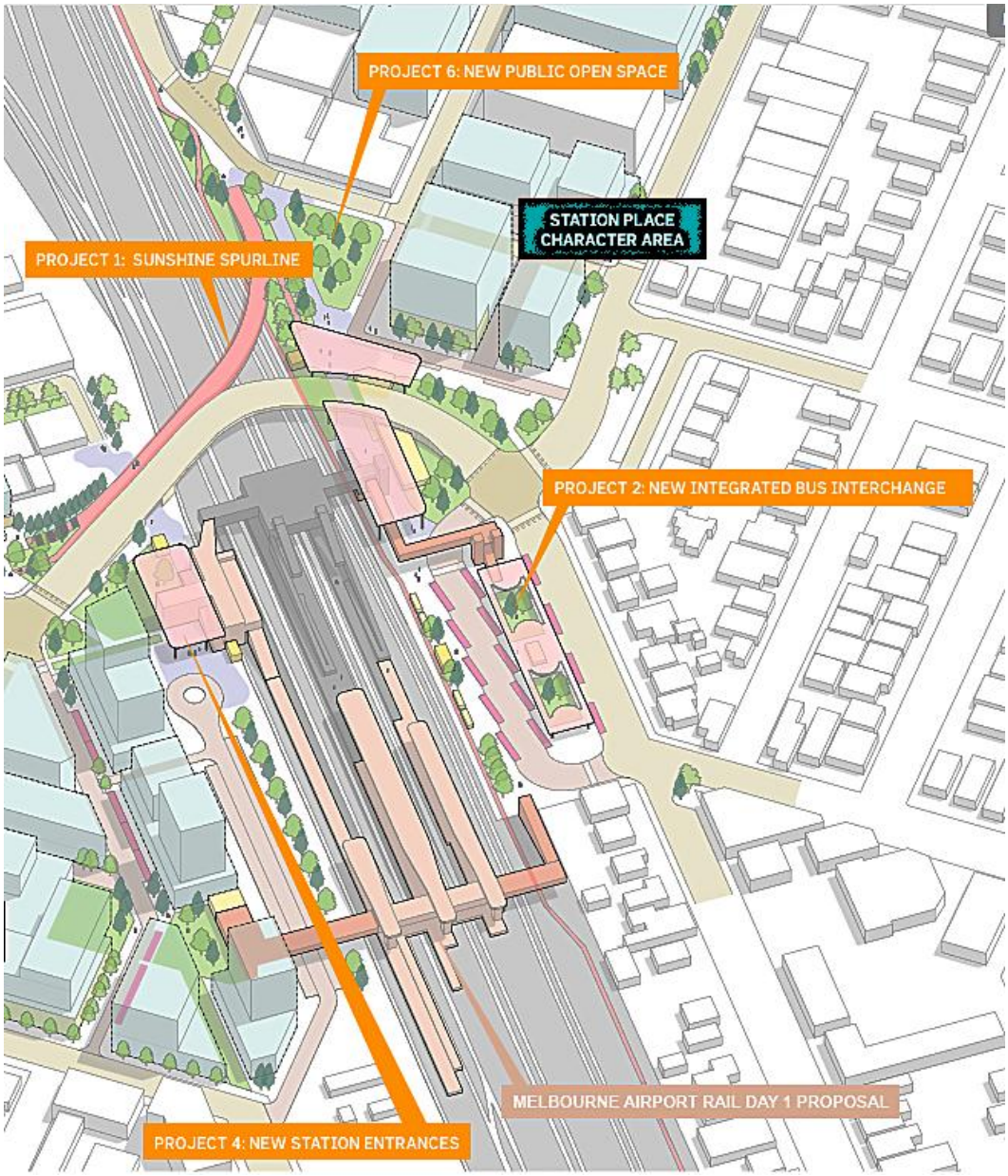
The works proposed for the First Stage of MARL, as shown below, will provide capacity for more than 1,000 trains a day, linking passengers to the Metro Tunnel, regional services and future trains to Melbourne Airport.



Sunshine Station redevelopment

Sunshine Station will need to be rebuilt and expanded to function in its new role as a SuperHub for transfers from suburban and regional services to the airport line.

The station and the immediately adjacent Hampshire Road overpass is currently a 'chokepoint' in the rail network. The proposed new airport lines will require the building of an additional span on the overpass, and its northbound road connection to Harvester Road will become a new cycling and pedestrian bridge to be known as the Sunshine Spurline.



Sunshine station will gain two new dedicated regional platforms and an extended concourse to improve passenger flow and connectivity. Other improvements will include an upgraded bus interchange and a new station forecourt with open spaces at each entrance. More details of the Sunshine Station Masterplan can be seen at https://www.vic.gov.au/sunshine-station-masterplan.

Major track works and new stations at Tottenham and Albion

Two major 'rail over rail' structures, to be constructed between West Footscray and Sunshine Stations, will eliminate current bottlenecks on six major regional and metro lines and greatly improve the efficiency and capacity of the rail network. The old tracks will be removed and more than 50km of new rail tracks will be installed.

The first overpass (below) is located between West Footscray and Tottenham and will carry the Sunbury/Bendigo line over the future Melton and Airport Line connecting to the Metro tunnel.

The second overpass (below) is located between Tottenham and Sunshine Stations and will facilitate access to Southern Cross Station by trains on the Bendigo Line.

The major track alterations associated with these overpasses will require the building of an entirely new station at Tottenham, provide for the future electrification of the

Melton line and deliver extensive signalling upgrades to allow more services. The new station will include upgraded lighting and a pedestrian underpass, improving local connections and safety.

A new station will be also constructed at Albion to accommodate future new track and bridge work for the Second stage of MARL.

Airport Jet Fuel Pipeline relocation

The new track work at Sunshine will necessitate the relocation of the jet fuel pipeline that runs between Altona and Melbourne Airport. Over the next eight months, crews will realign the 350 mm pipeline by boring a two-kilometre hole 30 metres underground. The hole will run between the Albion Station car park and a small reserve inside the rail corridor near Sunshine Road.

Crews will weld sections of steel pipe together in 250-metre sections and when boring is finished, they will pull the lengths through the bore hole. Andrew explained that the new pipeline will be connected without interrupting the flow of fuel.

Financial

The contract for the enabling works package and major upgrades was awarded to a consortium including McConnell Dowell, ARUP, Metro Trains Melbourne, V/Line, and VIDA Rail.

The project uses an Alliance model[4] for high-value capital works to manage risk. The agreed Total Estimated Cost of the project has been informed by the comprehensive VIDA database of recent, actual costs incurred in removing Melbourne's many level crossings and constructing new tracks and stations.

Stage 1 of MARL has been costed at $4.1 billion, jointly funded by the Commonwealth and Victorian governments and is scheduled for completion in 2030.

Concept image for the Albion flyover of Ballarat Road

The total cost for the entire Melbourne Airport Rail project - which includes new stations at Keilor East and the Airport, a 550 metre twin track bridge over the Maribyrnong River and a high level crossing of Ballarat Road at Albion has been estimated in the range of $8 billion to $13 billion.

A completion date has yet to be set for the entire Airport Link.

[4] An alliance contract is a collaborative, relationship-based agreement where project owners and contractors share risks, rewards, and decision-making to achieve common goals. It uses an "open-book" payment structure—covering costs and performance-based fees—and a "no-blame" culture to encourage innovation and efficiency in complex, high-stakes projects.

Andrew Pepplinkhouse addresses the Association
(Photo by Nick Szwed)

Some of the VRA audience
(Photo courtesy of Renee Shankar, VIDA)

MEMBER COMMENTS AND NEWS

Our Silent Car – by Brian Head

[Editor's note: I would like to thank Brian for this most interesting and informative article about his recent experience in purchasing and operating a fully electric vehicle. Given the recent concerns about the availability and cost of fuel for conventional vehicles and hybrids, it is encouraging to read such a positive review of an electric car from one of our members.]

I joined the CRB in 1959 and spent 5 years in Benalla Division on road construction and bituminous surfacing (and learning a lot from our wonderful overseers). I then worked for a year in Britain and, on returning, had 5 years in Materials Division on road research and quality control.

This was followed by 10 years in Dandenong Division on freeway construction. There were then extended periods in both Head Office and Dandenong Division, finally taking early retirement in 1994. Some consulting work followed, then 20 years as a part-time registered builder volunteering for a charity providing houses for disadvantaged families.

Having experienced an electric hire car a few years back I was convinced that, if there was a choice, you would not drive anything else. So two years ago when we replaced our 20 year-old Honda with an electric vehicle, having modern safety features, we chose a GWM Ora.

This was one of 3 entry level ($40,000) EV models at the time, although they are now available for around $30,000. In Victoria there is no financial encouragement to 'go electric' other than avoidance of the fuel excise component of petrol/diesel.

The Ora is a delight to drive, and electric vehicles have the following advantages over internal combustion engine cars:

- Simplicity. Electrical traction has very few moving parts compared to an internal combustion engine
- Quiet driving as there is only tyre noise
- Smooth transmission with massive acceleration (if you really need it!)
- Economy. Low driving cost as charging at home from the 3 pin plug is equivalent to paying only 50 c/l for petrol, but this gives a battery top up of only 10 km per hour. Using roof-top solar can reduce energy costs to zero. Public charging stations will cost double the home rate but can charge the battery at up to 400km per hour.
- Efficiency with minimal braking losses. Regeneration recharges the battery on slowing down, and braking is only needed for emergency and final stopping. This is a real benefit in stop-start city driving, and also for mountain driving where energy used in climbing is partially recovered on decent.
- Zero air pollution as there are no exhaust gases, fumes, leaks or oil to contend with.
- Convenience of no warmups required or cold start issues.
- Low maintenance. The servicing of our Ora is capped at $99 pa for 5 years. Under the bonnet there are just 4 fluid levels to regularly check: windscreen washer, battery coolant, vehicle a/c coolant, and brake fluid.
- Long warranty period. Our car has an unconditional warranty of 8 years for the battery and 7 years for the vehicle.

However these vehicles do have some real disadvantages:

- Low fuel range. The Ora battery is good for 400km which is quite adequate for city and near country driving. There are sufficient public charging stations along major routes but long distance driving requires advance planning. Additional charging stations are continually being installed but there is still a long way to go here.

  The battery can also be topped up using the 3 pin plug at motels etc (generally without cost). Regardless, the so-called 'range anxiety' is very real. While the fuel gauge estimates the km remaining in the battery this is dependent on vehicle speed, driving behaviour and heating/cooling demands.

- Uncertainty regarding public charging stations. On arrival at a charging station there can be a queue, resulting in a long waiting period. Being unmanned they are also prone to damage or being out-of-order. However mapping 'apps' generally advise of the current availability.

- The high battery weight results in a heavy vehicle, but this is not reflected in driving characteristics due to the car's very low C of G.

- There is no spare tyre, only a temporary repair kit. However this is supported by Australia-wide roadside assistance.

- LI battery fires are a concern. These are rare, being only 20% of all car fires. The 'runaway' feature of such fires requires complete water immersion to cool and extinguish. This is an issue for EV's in road tunnels and multi-story car parks.

- Environmental considerations. With no exhaust gases EV's contribute to cleaner air in our cities, but the manufacture and disposal of the batteries can have significant environmental effects. As some of the charging electricity is generated from non-renewable sources, this is also a consideration.
- Unknown second hand car value. With the limited history of long term battery life and vehicle maintenance costs the initial low travel cost of EV's may be prejudiced after warranty periods expire – time will tell!

Going electric for road transport is a real 'game changer' after over a century of internal combustion traction. However with improved onboard energy storage it is surely the way of the future.

Brian Head 30/3/26

Funnies

Special thanks to Graham Gilpin and Nick Szwed for these gems.

The Bagpiper

As a bagpiper, I play many gigs. Recently I was asked by a funeral director to play at a graveside service for a homeless man. He had no family or friends, so the service was to be at a pauper's cemetery in the Nova Scotia back country.

As I was not familiar with the backwoods, I got lost and being a typical man, I didn't stop for directions.

I finally arrived an hour late and saw the funeral guy had evidently gone and the hearse was nowhere in sight.

There were only the diggers and crew left and they were eating lunch. I felt badly and apologized to the men for being late.

I went to the side of the grave and looked down, and the vault lid was already in place. I didn't know what else to do, so I started to play.

The workers put down their lunches and began to gather around. I played out my heart and soul for this man with no family and friends. I played like I've never played before for this homeless man.

And as I played "Amazing Grace", the workers began to weep. They wept, I wept, we all wept together. When I finished, I packed up my bagpipes and started for my car. Though my head was hung low, my heart was full.

As I opened the door to my car, I heard one of the workers say, "I've never seen anything like that before, and I've been putting in septic tanks for twenty years."

Apparently, I'm still lost ... it's a man thing.

Roadside stop

A man and his wife are driving down the road when a cop pulls them over.

The cop says to the man:

- Do you know that you were speeding, sir?

- No officer, I didn't know I was speeding...

The wife then says:

- Come on, Henry, you knew you were speeding, I've been telling you to slow down for miles.

The man shoots a dark look at his wife, then the cop says:

- Well, since I've got you pulled over did, do you know that the tag on your license plate is expired?

- No sir, I did not know that...

The wife says:

- Oh please, Henry! I've been telling you to go get it up to date for 2 whole months now!

The husband grinds his teeth but keep silent. The cop then adds:

- And I noticed that you left rear lights weren't working either.

- Oh yes, I was on my way to get them changed, actually.

The wife says:

- Nonsense, we were going home. You keep saying it doesn't need to be changed, that the other drivers can see you well enough.

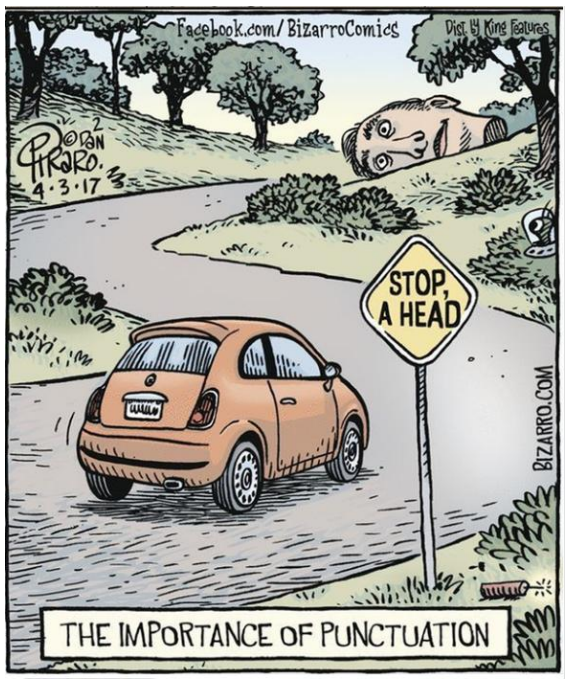
The man explodes with anger:

- WILL YOU SHUT YOUR GODDAMN PIEHOLE

The cop walks over to the woman's side of the car and asks her:

- Does he always talk to you this way?

- Oh no, officer, only when he's been drinking.



West Gate Freeway – by David Jellie

[Editor's note: David Jellie has provided this excellent first instalment of the history of the West Gate Freeway. He told me:

> *Richard Warwick suggested that we should develop some brief histories of some of the CRB/RCA/VicRoads projects, and I was asked if I would do the West Gate Freeway. I had an involvement in the construction of the approaches to the bridge on both sides of the Yarra River.*
>
> *Although West Gate Bridge was not part of the history of CRB/RCA/VicRoads it looms so large in our history, I decided to record its story also. It was the bridge that created the stories of the approaches, and the freeway is now one of Australia's busiest roads.*
>
> *In telling the story of West Gate Bridge, I was very fortunate to find some professional photographs taken by our member, Rob Morgan, when he was an engineering student. They are a very valuable record, and he has kindly given me permission to publish them.*
>
> *This is the first instalment. It is about the history of the bridge itself. I will provide later instalments about the construction of the approaches.*]

The West Gate Freeway links the Princes Freeway in the west to the Monash Freeway in the east – a distance of 13.7 km. Its most prominent feature is the West Gate Bridge over the Yarra River.

This schematic map shows the West Gate Freeway extending from the Princes Freeway in the west to the portal of the Burnley Tunnel in the east. It also shows the later connections to the West Gate Tunnel, CityLink and the Monash Freeway east of the Burnley Tunnels.

A crossing of the Yarra River to connect the City of Melbourne to the west goes back to 1888 when Victoria's Public Works Department proposed a tunnel under the river. In the meantime, various ferries operated from Fisherman's Bend to Newport - up until 1974. Other proposals were tentatively considered but it wasn't until 1957 when more determined action was initiated by the Western Industries Association which represented major industries in the western suburbs.

The Association formed a sub-committee to investigate a crossing of the Yarra, and in 1958 it asked the Victorian Government 'to give urgent consideration to construction of a traffic tunnel under the Yarra.' The Association had been told by shipping interests that a bridge would not be acceptable for the crossing. The tunnel, it was suggested,

would carry 30,000 cars a day; differing estimates on the capacity of the 'overtaxed' ferry suggested it could only handle between 1,200 and 2,000 per day. [5]

The Victorian Government's response to the proposal was that its finances were inadequate to undertake a crossing urgently and that any such project would therefore require private investment. In 1961, the Lower Yarra Crossing Limited was formed. It was a non-profit company whose mission was to develop a concept for the crossing and its subsequent implementation.

In 1964, a committee was appointed to examine the question of whether a crossing should be made by way of a bridge, which would be sufficiently high to keep the river open to shipping, or whether it would be more appropriate to construct a tunnel. The committee failed to agree on this question, but the Government eventually decided that the crossing be a high-level bridge.

The Williamstown Ferry – circa 1971.

In 1965, the Lower Yarra Crossing Ltd went into voluntary liquidation and a new company was formed called the Lower Yarra Crossing Authority Limited (LYCA). The Lower Yarra Crossing Authority Act 1965 (No. 7365) vested the Authority with certain powers, the general purpose of the Act being that it would be able to borrow money on debentures, to finance the construction of the crossing.

It was given the necessary powers for the compulsory acquisition of land and to impose tolls on the bridge to enable it to repay the debenture debt the company raised. Thus, the bridge would be paid for by those using it, and eventually, it would become the property of the Crown.

[5] West Gate Freeway now carries over 200,000 vehicles each day including a high percentage of freight vehicles.

The LYCA engaged a world-renowned British consulting firm, Freeman Fox and Partners (FFP), to design a cable-stayed bridge. FFP specialized in the design of large, steel bridges the most notable of which was the first Severn Bridge (main span 988 m) opened by Queen Elizabeth II in 1966. The Severn Bridge is a motorway suspension bridge that spans the River Severn between South Gloucestershire in England and Monmouthshire in South East Wales.

View of the Severn Bridge designed by FFP and opened in 1966.

The founding partner of FFP, Sir Ralph Freeman, played a leading role in the design of Sydney Harbour Bridge and the Victoria Falls Bridge over the Zambezi River on the border of Zambia and Zimbabwe in Africa. Both these bridges are long span arch bridges. His successor in 1950, his son, also Sir Ralph Freeman, was instrumental in the design of the Forth Road Bridge in Scotland – at the time, the longest suspension bridge in Europe.

While these famous steel bridges may have demonstrated FFP's credentials to design a crossing of the Yarra – as an arch or suspension bridge – they chose a design for a cable-stayed bridge, steel box girder bridge. West Gate Bridge featured the world's longest cable-stayed steel box girder span, measuring 336 m. It was a pioneering engineering project for its time. This type of structure for long-span bridges was just coming into vogue although versions of cable-stayed bridges date back to the 19th century (and earlier). The steel-decked Strömsund Bridge in Sweden (1955) is generally cited as the first modern cable-stayed bridge.

A cable-stayed bridge is a type of bridge that has one or more towers, from which cables support the bridge deck. A distinctive feature is the cables or stays, which run directly from the tower to the deck, normally forming a fan-like pattern or a series of parallel lines. This is in contrast to the modern suspension bridge where the cables supporting the deck are suspended vertically from the main cables, which run between the towers and are anchored at both ends of the bridge.

The cable-stayed bridge is optimal for spans longer than cantilever bridges and shorter than suspension bridges. This is the range within which cantilever bridges would rapidly grow heavier, and suspension bridge cabling would be more costly.

The bridge was over 2.5 km long, 37 m wide (to accommodate eight lanes of traffic) and nearly 60 m above the Yarra River, allowing the passage of sea-going vessels between Hobson's Bay and the dock complex upstream.

The structure is founded partly on piles and shallow footings on basalt rock, but principally on cylinders carried to rock 40 to 60 m below natural surface.

The substructure comprises concrete piers. The two towers supporting the main spans are steel and they rise 45 m above the deck to a height of 103 m above water level. The pier spacing for the river span is 336 m. The superstructure is of steel cable-stayed box girder construction for the central five spans, and pre-stressed concrete box girders elsewhere.

The eastern concrete approach spans being built, viewed from near Todd Road – May 1970.
(Image courtesy of Rob Morgan ARPS)

Construction of the bridge commenced with an air of anticipation, pride and optimism. But beneath the grandeur and elegance of the iconic bridge lies a tragic story that will forever stain its achievement.

During construction on 15 October 1970, a span of the bridge collapsed killing 35 men and leaving many more families shattered. The collapse was sudden and devastating - killing people on the ground below the bridge as well as many who were on the deck. It remains Australia's worst industrial disaster.

The 2,000-tonne section of the bridge that collapsed in 1970.
(Image courtesy of the Public Records Office).

A Royal Commission was appointed to investigate the causes of the disaster. It published its results in August 1971 and found that the collapse was caused by a combination of critical design flaws by FFP and unsafe and unconventional construction methods by the contractors, World Services and Construction. The report, chaired by Mr. Justice Barber, highlighted a fatal "constant sense of urgency" to meet deadlines, which compromised safety and led to disastrous attempts to correct a buckle in the structure.

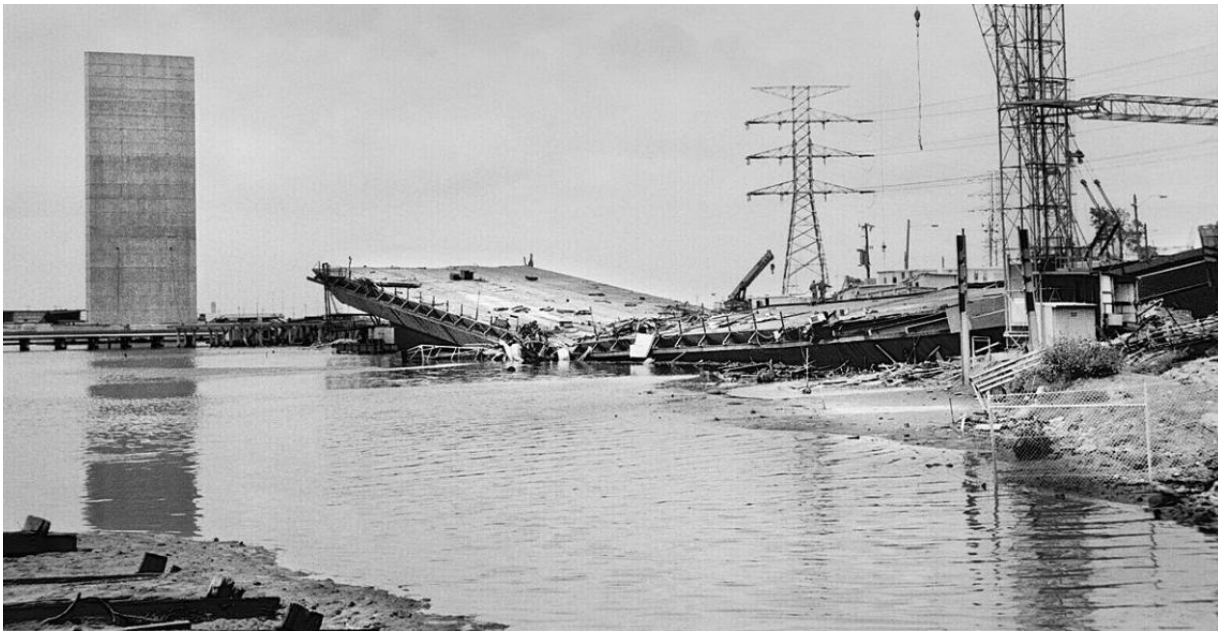
The Key findings of the Royal Commission can be summarised as follows:

- **Immediate cause:** The collapse was triggered by the removal of a large number of bolts from a transverse splice in the upper flange plating of span 10-11, an attempt to fix a buckle in the steel that had been caused by heavy loading (kentledge) to correct camber errors.
- **Design failures:** The Commission criticized the design for having an insufficient margin of safety.
- **Construction failures:** The methods used for assembling and adjusting the steel spans were deemed improper and dangerous.
- **Management and communication breakdown:** A major contributing factor was the poor communication between engineers and contractors, along with a, "failure to make adequate inspections".
- **Urgency pressures:** The report highlighted that the relentless pressure to complete the project on time created an environment where safety was overlooked.
- **Split responsibility:** The project suffered from a complex, divided responsibility structure between the designers and contractors.

In addition to these findings was the constant pressure by the trade unions – especially on demarcation issues – which slowed progress and caused alienation between the parties.

View from the eastern viewing point. Span 10-11 which collapsed in October can be seen in its two halves: the north half up on the piers and the south half jacked up to near full height, ready to be rolled across. (Image courtesy of Rob Morgan ARPS)

View from the eastern viewing point. Span 10-11 has collapsed, knocking over Pier 11. (Image courtesy of Rob Morgan ARPS)



The fallen span beside Stony Creek, with Pier 12 on the left.

Looking down onto the fallen span from the top of Pier 10.
(Images courtesy of Rob Morgan ARPS)

Many warning signs were ignored during the lead up to the collapse.

A 110 mm difference in camber was discovered where two halves of the box girder met. Instead of placing a hold on work, ten eight-tonne blocks of concrete kentledge were used on the north side of the joint in an attempt to deflect the edge to align with the edge on the south side.

This led to further buckling, and when the central bolts holding the joint together were removed, the collapse was precipitated.

Just months earlier, another steel box girder bridge under construction at Milford Haven in Wales collapsed, killing four workmen. This bridge was also designed by FFP.

Naturally, the West Gate construction crew were especially worried as they too were experiencing similar problems. FFP's response was to fly the project's head engineer and designer to Melbourne to reassure

workers that the bridge was safe. A meeting was held, a vote was taken, and everyone went back to work.

The toxic culture on the project inhibited open discussion of problems. It is reported that some workmen noticed things which should have been cause for a red flag but the hierarchies on the site at all levels mitigated against remedial actions. Health and safety measures were inadequate and the various parties should have had in place a communication system that encouraged all personnel to air their grievances without fear of retribution. This is at both a working level and a management level. Things were hidden from view and as they cascaded one upon the other, the disaster continued to build and eventually rolled out with the inevitability of a Greek tragedy.

The Royal Commission stated that "Fundamental to the whole sorry situation was a constant sense of urgency and pressure to complete the construction within specified times." It also noted: "No one can blame the Authority for a desire to keep its contractors up to schedule… Nevertheless, the determination to keep the work moving at all costs was so extreme as to engender an atmosphere in which speed was all–important consideration." This urgency also hampered and discouraged communication to the detriment of the integrity of the structure and the safety of the workforce.

I am also of the opinion that the designers were too far from the site. The bridge was designed in England and being built in Australia thus preventing the designers and builders working in close collaboration. Designing a bridge for service conditions is only one aim, as bridge components may experience greater stresses due to construction sequences and techniques and these need to be taken into account. The distance between the designers and builders was too great to allow this to happen – keeping in mind that communication systems were far less efficient than we enjoy today. There were no services such as email and fax available at the time.

Dare it be mentioned, I suspect there was a colonial master and servant relationship that pervaded FFP's relationships with the Australian parties. With their international renown and reputation, there may have been an attitude of 'We know best.' Certainly, Sir Ralph Freeman's appearance at the Royal Commission was unhelpful and somewhat aloof.

Following the publication of the Report of the Royal Commission in August 1971, the Lower Yarra Crossing Authority[6] formed its own Directorate of Engineering to be responsible for the re-design, supervision of construction, and contract administration of West Gate Bridge until its completion.

Intensive reviews of the structure focused attention on the inadequate strength of the original design of the bridge's deck. This consisted of a 100 mm reinforced concrete slab acting compositely with a steel plate stiffened by bulb flats. Numerous proposals were examined and the final solution was to replace the original steel and concrete deck by a lighter and stronger orthotropic steel deck. This orthotropic deck is a steel plate stiffened longitudinally by closely spaced cellular troughs and laterally, at intervals, by cross beams.

A Proof Engineer from Germany (Professor Karlheinz Roik) was appointed to independently check the re-design of the bridge in accordance with the recommendations of the Royal Commission. The re-design was also checked against

[6] The Lower Yarra Crossing Authority changed its name to the West Gate Bridge Authority in 1974.

the German code and the Appraisal Rules of the Merrison Committee's reports.[7] The re-design was also endorsed by four other university professors of civil engineering: F.B. Bull (Adelaide), N.W. Murray (Monash), J.W. Roderick (Sydney) and L.K. Stevens (Melbourne).

Following design alterations, reconstruction of the West Gate Bridge recommenced in 1972, and was finally completed in 1978, at a cost of $202 million - over eight times the original estimate.

An aerial view of West Gate Bridge – date unknown

David Jellie. April 2026

[7] The 1970–1971 Merrison Committee, chaired by Sir Alec Merrison, was established by the UK government following fatal collapses of steel box girder bridges at Milford Haven in Wales and West Gate. It revolutionized structural engineering by introducing stringent Interim Design and Workmanship Rules, which mandated independent design checks and safer construction methods.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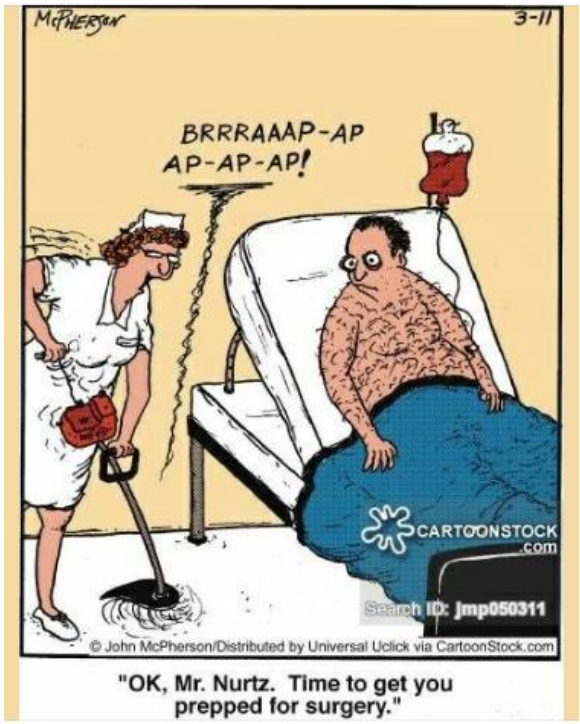
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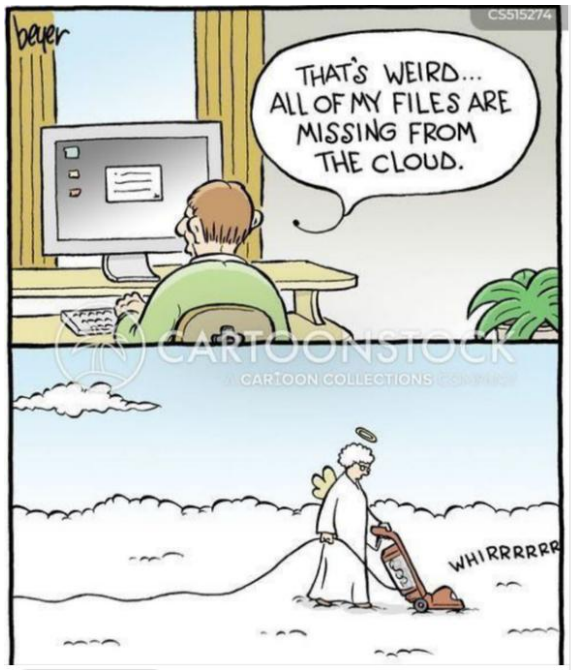
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