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# INPAC (Infrastructure Network Planning and Alignment Clearance)

AEC Summit at GWF 2026



# Our mission is “to make Singapore a great city to live, work and play”.

We strive to create an endearing home and a vibrant city through long-term planning and innovation, in partnership with the community.



The Urban Redevelopment Authority (URA) is Singapore’s land use planning and conservation authority. Our mission is to make Singapore a great city to live, work and play.



We adopt a long-term and comprehensive planning approach to formulate strategic Long-Term Plan and Master Plan to guide the physical development of Singapore in a sustainable manner.



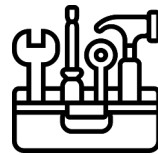
We strive to create a vibrant and sustainable city of distinction by planning and facilitating Singapore’s physical development in partnership with the community.

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## Infrastructure Planning Authority Group (IPAG)

Formed in 2022, IPAG is responsible for coordinating the master planning of major infrastructure across the I&E sector through the annual National Infrastructure Plan (NIP) review for alignment between major infrastructure plans and land development for the upcoming years, from which we identify opportunities for better coordination of major infrastructure.

IPAG will **appoint Lead Implementing Agencies (LA)** to coordinate the planning and implementation of multi-agency infrastructure network projects to achieve the following Whole-of-Government (WOG) outcomes:



- Optimise space for all existing & future infrastructure



- Identify and reap synergies to achieve time & cost savings in implementation



- Enhance efficiency in coordination for infrastructure projects

# Major Infrastructure Network Approval Workflow (IPA Workflow)

Strengthening coordination and capabilities to achieve significant time, cost and land savings for major infrastructure projects



**Large Water Pipes**  
( $\geq 800\text{mm}$  diameter)



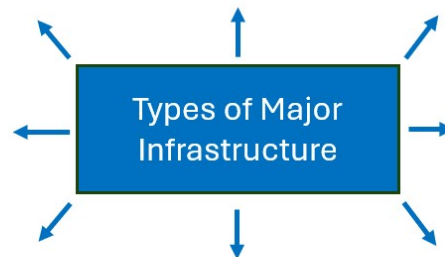
**Large Sewers**  
( $\geq 900\text{mm}$  diameter)



**Transmission Gas Pipes**  
( $\geq 600\text{mm}$  diameter)



**Roads & Rail Tunnels**



**Large Drains & Canals**



**Major Roads**  
(incl. new roads / viaducts,  
road widening etc.)



**Transmission Electrical Cables  
& Tunnels**  
(incl. 66kV, 230kV, 400kV)



**Common Duct Network  
(Telco)**

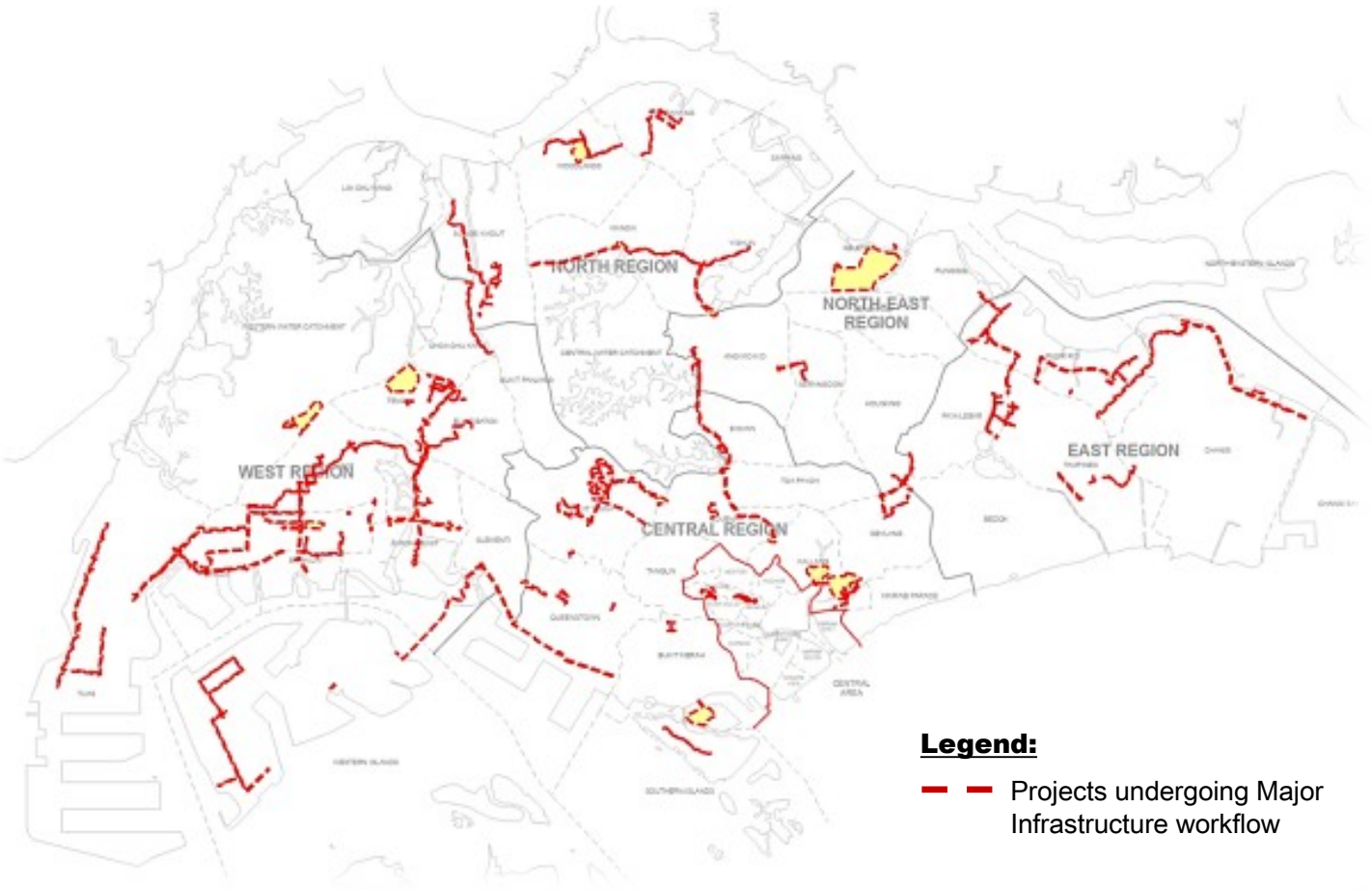
# Tangible Outcomes

Significant cost savings and time avoidances have been achieved since rolling out the IPA Workflow in 2022\*

**104**  
PROJECTS APPOINTED

**272km**  
CORRIDORS

**35km**  
UTILITY SPECIFIC  
DUCTS (USDs)  
CORRIDORS PLANNED



\* Pilot phase in 2022 – 2023 and full-scale implementation from 2024 onwards

## INPAC as a GIS-enabled Consultation Platform

to enable scaling up of IPA Workflows across islandwide major infrastructure projects to maximise cost and time savings.



### GIS Map Services

- Provide utility infra data layers leveraging on Singapore's national geospatial and mapping infrastructure, i.e., SLA's GeoSpace
- Show useful corridor insights, data analytics and LA's GIS submissions
- Transitioning to 3D GIS



### Streamlined Consultations

- Replace manual email consultations
- Support multi-agency consultations between LA and Reviewing Agencies (RAs)
- Document consultations and monitor their status
- Service standards with reminders and notifications



### Analytical Tools

- Faster and more efficient planning and design
- Comprehensive checks to evaluate alignment feasibility

To achieve **time and cost savings/avoidance for your infrastructure and utilities projects** and to **optimise and futureproof our underground space**

# Using INPAC

to save time and cost for LA projects



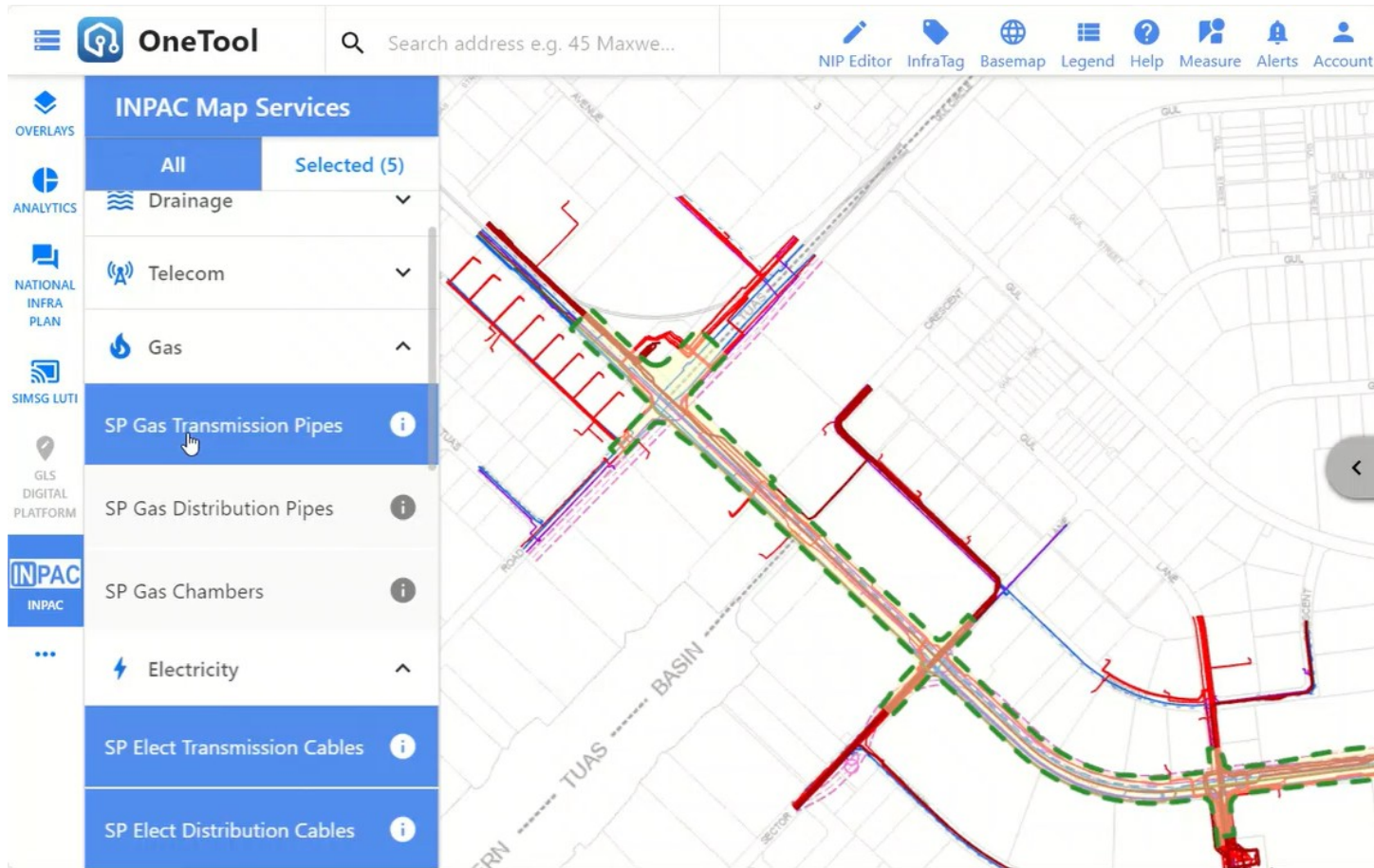
\*Including avoidance of abortive works; these time savings based on various reasoned assumptions, which may differ based on project details, officer proficiency, and other factors.

# INPAC User Interface at A Glance

The screenshot displays the INPAC web application interface. At the top, there is a search bar with the text "Search address e.g. 45 Maxwell Road". The main map area shows a street grid in Tampines with various utility lines overlaid in different colors: red for drainage, blue for sewerage, green for water, yellow for gas, and purple for electricity. The sidebar on the left contains navigation options under "INPAC Map Services", including "All Selected (166)", "GIS Submissions", "INPAC", "NIP", and "GeoSpace". Below these are expandable categories for "Drainage", "Sewerage", "Water", "Gas", "Electricity", and "Telco (A-G)", "Telco (H-Q)", and "Telco (R-S)". The right sidebar provides project details for "P20240021" (URA (LA)), showing consultation statistics: 27 closed consultations, 0 in-progress consultations, and 0 overdue consultations. A warning message states "The LA corridor for this project has not been safeguarded." Below this is a "Project Milestones" section with a vertical timeline showing completed steps: LA Appointment (21/08/2024), Conceptual Planning (04/09/2024), and Preliminary Design (04/09/2024), followed by Detailed Design (23/09/2024), Construction, and Project Completion.

# GIS Map Services of WOG Subterranean Utilities

Allow convenient referencing during consultations



View comprehensive and updated WOG utility map data layers from agencies for existing and proposed infrastructures

Water, Drain, Sewer	Telecom	Elect, Gas	Road, Rail	Others
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- ✓ Allows you to **view data/plans within your project boundary**
- ✓ **Regular refreshing** of data layers
- ✓ **Georeferenced** data layers for seamless interoperability between systems
- ✓ **Structured layer grouping** with **harmonised colour-coding**

Potentially **2 months** saved with early access of digitised GIS plans

Alignments shown on map services are indicative and to be verified on site. Purchase of plans via SLA's INLIS and other platforms is still required as per current practice.

# GIS Map Services of WOG Safeguarded Corridor

## Protect LA's Coordinated Alignment Designs

INPAC Map Services

All Selected (1)

< LA Infra Layers

- LA Proposed Infra Works
- Geo-Located Utility Plans
- LA Corridors
- WOG Safeguarded Corridors
- LA Project Boundary
- LA Project View Buffer

### With WOG safeguarding process:



**Safeguarding** of LA's coordinated alignment for other agencies' awareness of LA's presence.

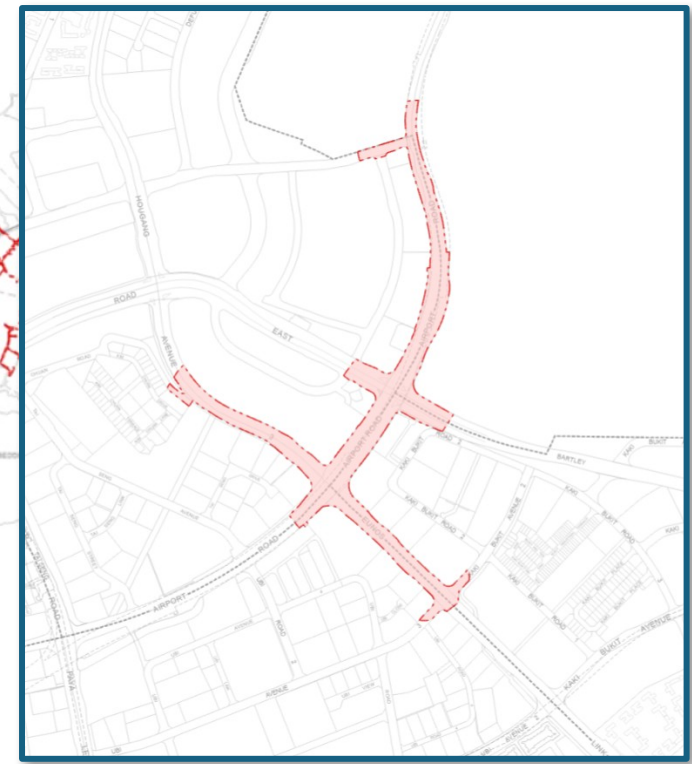


Agencies and licensees must **check and seek LA's clearance** for any proposed works within the corridor.



**Publishing** of updated WOG Safeguarded Corridor layer from INPAC to WOG and G2B portals

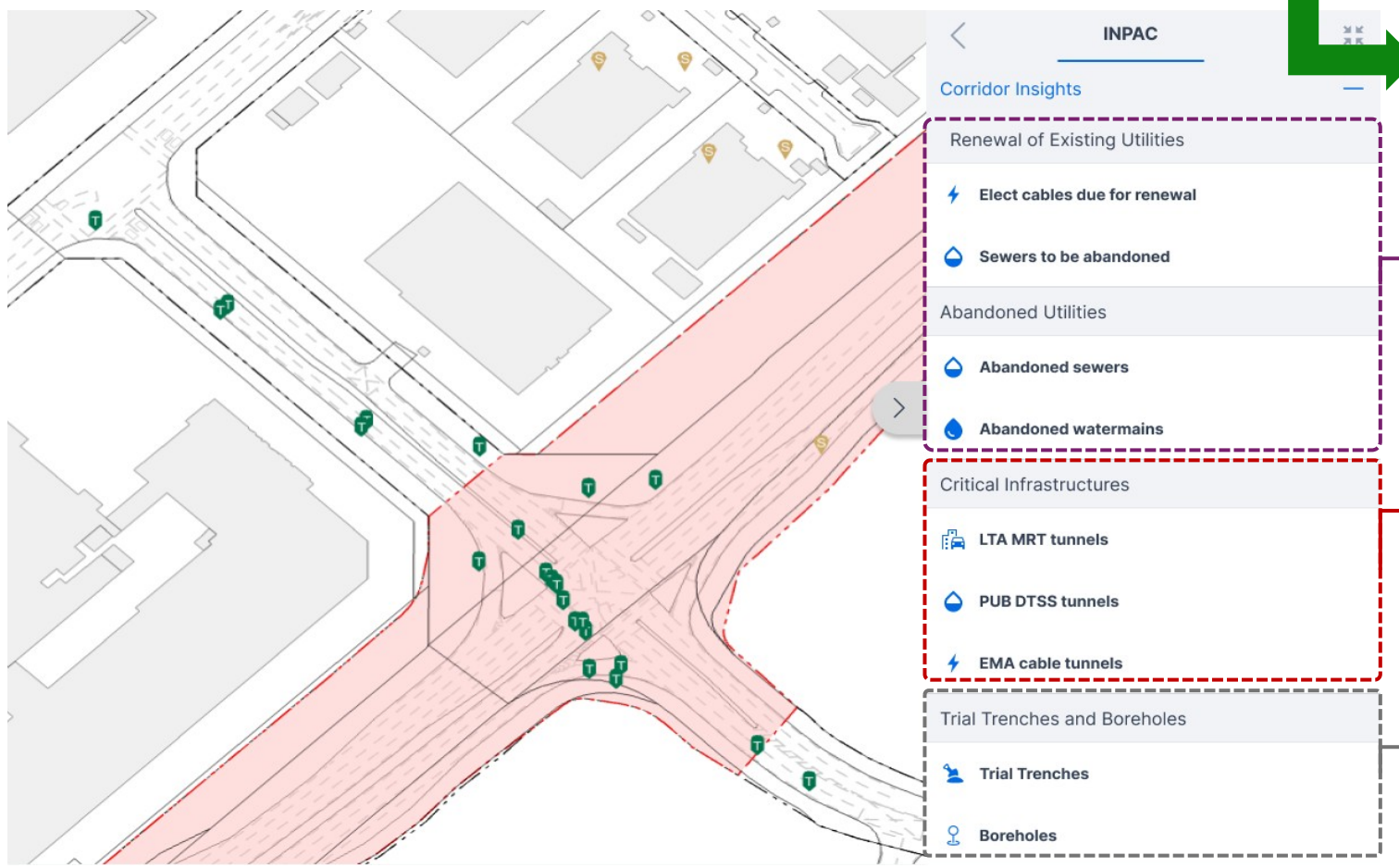
Potentially **3-12 months** of time and cost avoidance from abortive works



# GIS Map Services of Corridor Insights

Provide important information about your project corridor

GIS technology allows seamless retrieval of data from SLA's GeoSpace into INPAC



Creates early planning awareness for **potential time and cost savings/avoidance** from diversions, clashes, and repeated works

**Renewal & abandoned utilities**

- Potential reuse of occupied space for new utilities to avoid diversions

**Critical infrastructures**

- For avoidance of critical subsurface infrastructure like MRT tunnels, DTSS, cable tunnels

**Past trial trench and borehole data**

- Possible to obtain past records from SLA INLIS\* to avoid repeated excavation works

\* A one-stop portal which allows you to obtain property and land survey information such as property ownership information and survey plans

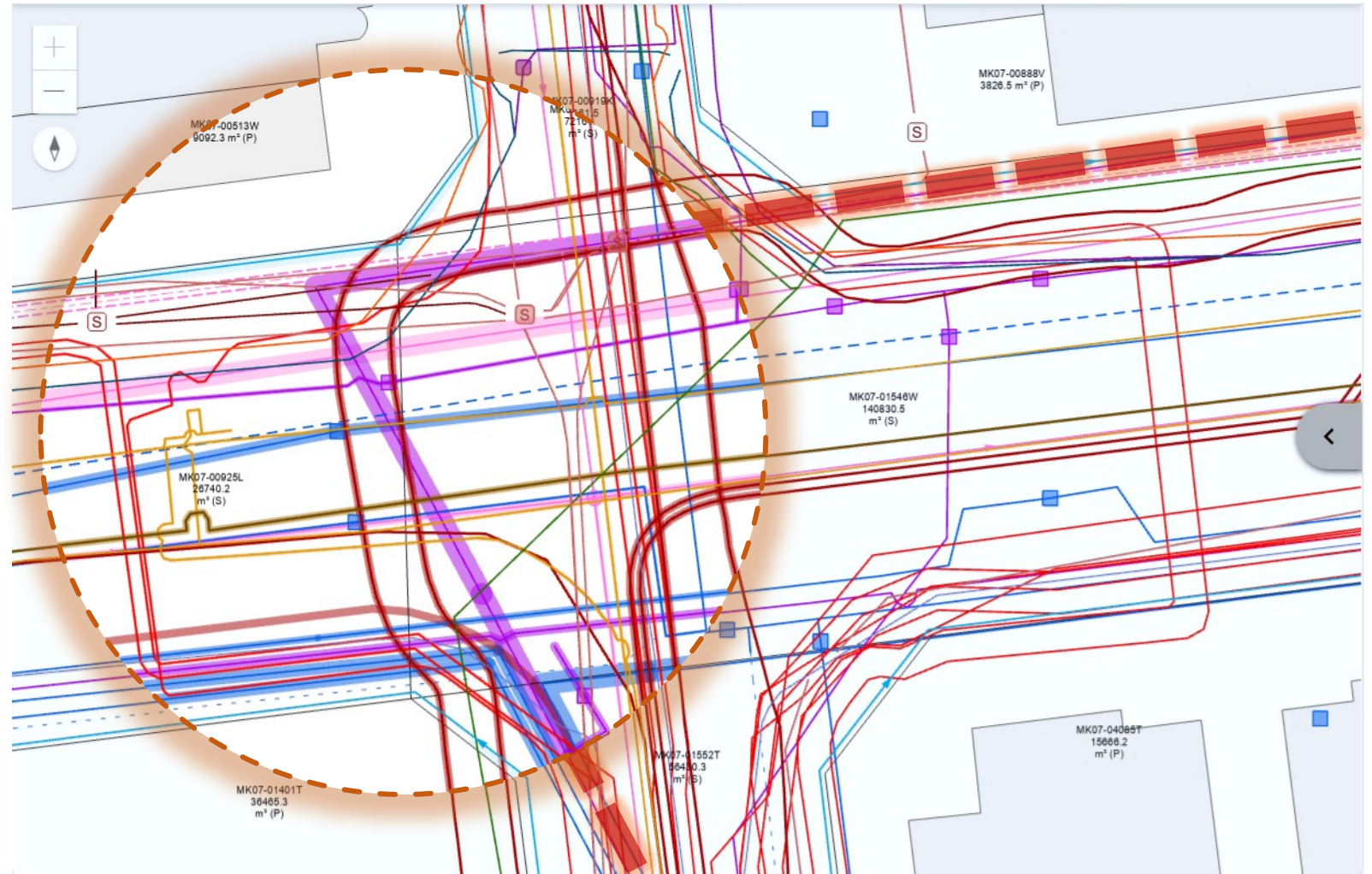
# GIS Map Services of Data Analytics

Result in potential time savings from Desktop Studies

## 1. Infra Shadow

Shows approximate **footprint taken up by existing infrastructure alignments** by buffering the critical size information for each infra element

You can now **better appreciate the space occupied** by existing utilities



# GIS Map Services of Data Analytics

Result in potential time savings from First-Cut Desktop Studies

## 1. Infra Shadow

Shows approximate **footprint taken up by existing infrastructure alignments** by buffering the critical size information for each infra element

You can now **better appreciate the space occupied** by existing utilities

## 2. Usable Space

Shows all the **available space** within the project boundary

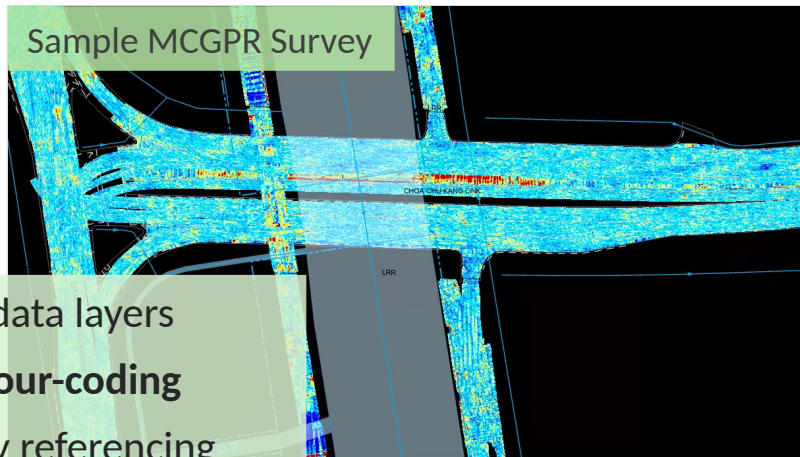
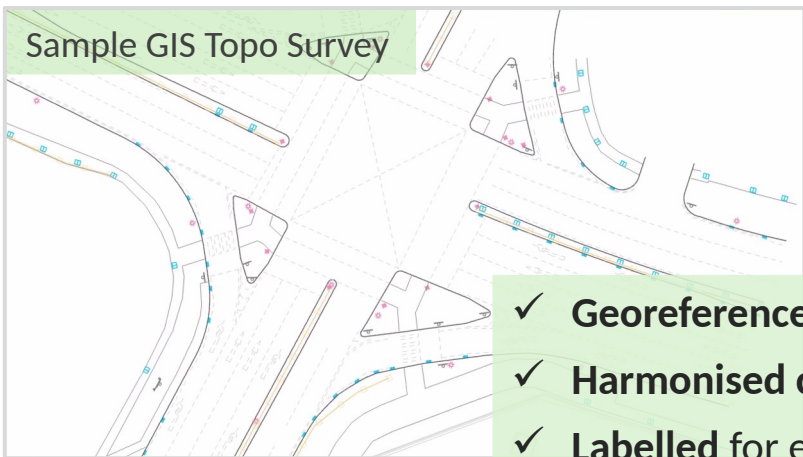
You can now **easily find potential corridors for new utilities** for further detailed studies (e.g. cross-sections)



# GIS Map Services of LA Submissions

Keeps all stakeholders on the same page

INPAC ingests **standardised GIS submissions** by LA, consultants and/or contractors



- ✓ Georeferenced data layers
- ✓ Harmonised colour-coding
- ✓ Labelled for easy referencing

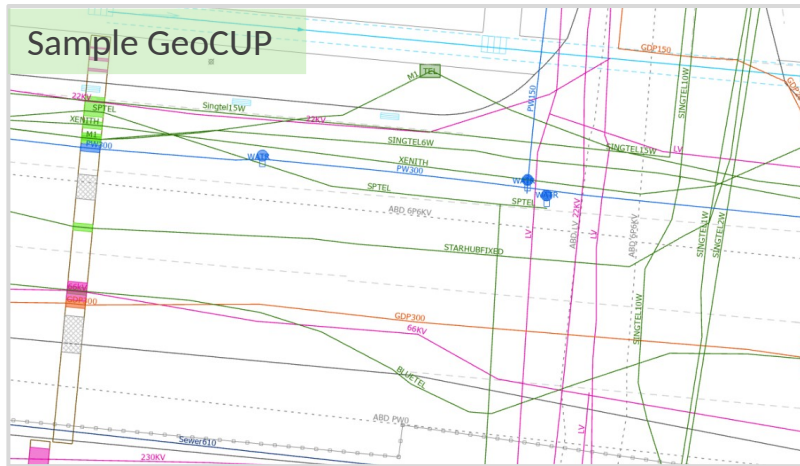
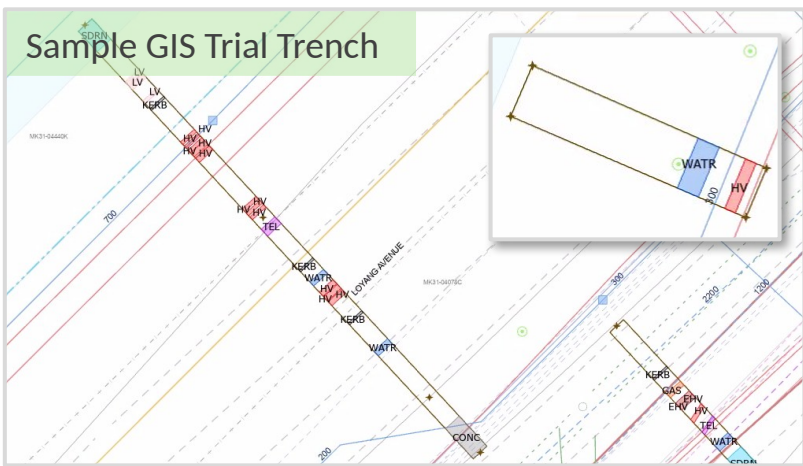
Findings from **each Site Investigation (SI) method** are shown in separate GIS layers with indication of survey date



All project stakeholders can **view the SI GIS layers** on INPAC



Greater **transparency, confidence, and assurance** during consultations



- Submissions are **logged in INPAC** and may be **used by future projects**
- **Your future projects will also benefit from past LA submissions** (e.g. site investigation findings, GeoCUP)

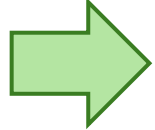
# Consultations are Made Easy

Between Lead Implementing Agencies (LA) and Reviewing Agencies (RA)

**INPAC Functions**

Enter as Lead Agency (LA)  
To make / view consultation

**Initiate consultations**  
as a LA, consultant, contractor,  
or licensee for your LA project



**INPAC Functions**

Enter as Reviewing Agency (RA)  
To review / view consultation

**Review consultations**  
as a Reviewing Agency (RA) or  
licensee to respond to LA's  
consultations

**Consult IPAG**  
Obtain support and clearance from IPAG

Submit To

- URA (IPAG)
- PUB (WRN)
- PUB (WSN)
- PUB (C&W)
- LTA
- JTC
- HDB
- EMA
- IMDA
- NParks (PP)
- NParks (GDP)
- SPPG
- SPPG (Gas Tx)
- SPPG (GAS Dx)

**Consult by selecting the agency**  
and the case will be routed by the  
RA rep to the appropriate RA Officer  
in Charge (OIC)s

**Consult multiple agencies at once**  
Individual cases will be sent to the  
selected agencies

**Attach supporting documents**  
Similar to email, e.g. PDF, ZIP, DWG, DOCX etc.

Name	Date modified	Type	Size
Test DGN.dgn	14/11/2025 6:25 pm	Bentley MicroStati...	0 KB
Test DWG.dwg	14/11/2025 6:25 pm	DWG TrueView Dr...	0 KB
Test EXCEL.xlsx	14/11/2025 6:25 pm	Microsoft Excel W...	0 KB
Test JPEG.jpeg	14/11/2025 6:25 pm	JPEG File	0 KB
Test PDF.pdf	14/11/2025 6:25 pm	Adobe Acrobat D...	0 KB
Test PNG.png	14/11/2025 6:25 pm	PNG File	0 KB
Test PPT.pptx	14/11/2025 6:25 pm	Microsoft PowerP...	0 KB
Test WORD.docx	14/11/2025 6:25 pm	Microsoft Word D...	0 KB

Potentially **2-4 weeks of time saved** from simplified process of reaching the correct reviewing officers

# Consultations are Monitored and Tracked

## In the Project Homepage

**Monitor your active consultations**

See which consultations are in-progress or overdue

**Track project milestone**

View current project stage and commencement date of each stage

**Project Consultations**

- 17 closed consultations
- 3 in-progress consultations
- 3 overdue consultations

**Project Milestones**

- 1 LA Appointment (17/01/2025)
- 2 Conceptual Planning (17/10/2025) - **Current Stage**
- 3 Preliminary Design
- 4 Detailed Design
- 5 Construction
- 6 Project Completion

**Guided process**

Takes you through the project stages step-by-step

**Conceptual Planning**

**Data Collection** (17/10/2025 - now)

- 2 | EMA
- 8 | URA (IPAG)
- 2 | PUB (WRN)
- 1 | SPPG (Gas Tx)
- 1 | SPPG (GAS Dx)
- 1 | JTC
- 2 | IMDA
- 1 | HDB
- 2 | PUB (WSN)
- 1 | PUB (C&W)
- 1 | LTA

**Pre-consult IPAG** (11/11/2025 - 11/11/2025)

- 1 | URA (IPAG)

**Stakeholder Consultation**

**Report Submission**

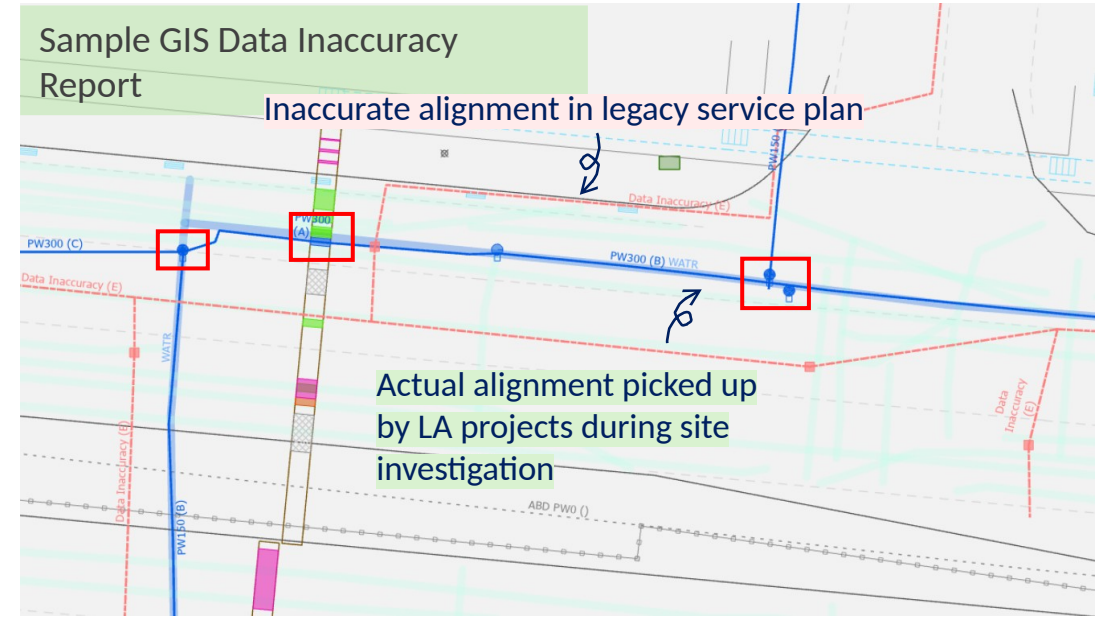
[Back](#)

**Track consultation approval status**

- ✓ Reflect number of consultations with each RA
- ✓ Colour-coded to reflect decision status of each RA

# [Upcoming] GIS Map Services for Inaccuracies

Alerts future projects of past inaccuracies found in legacy services plans



LA collates legacy services plans

Utility owner to be updated of inaccuracies for awareness

LA conducts site investigations and capture data inaccuracies

Site investigation findings and data inaccuracy visualisation in INPAC

Data Inaccuracy Report routed back to utility owners

To ascertain alignment of existing utilities

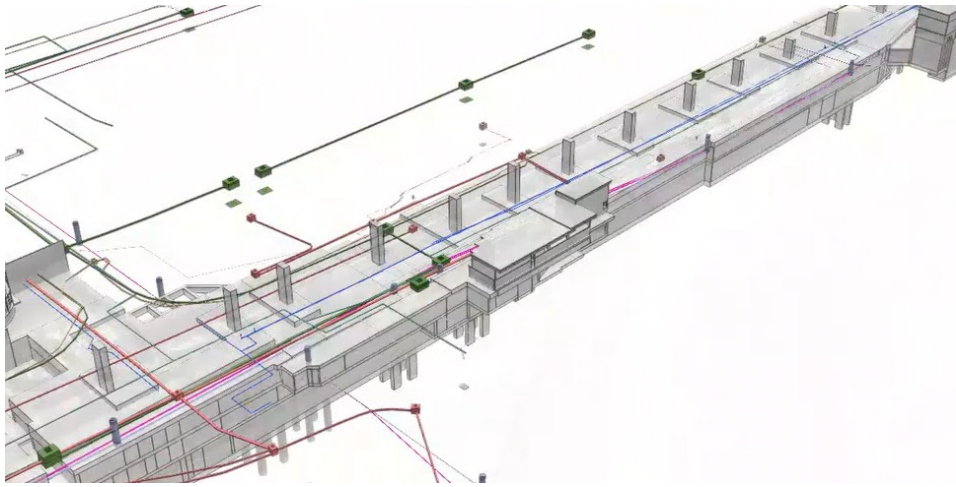
✓ Future projects will know of past inaccuracies found in legacy services plans within your project corridor



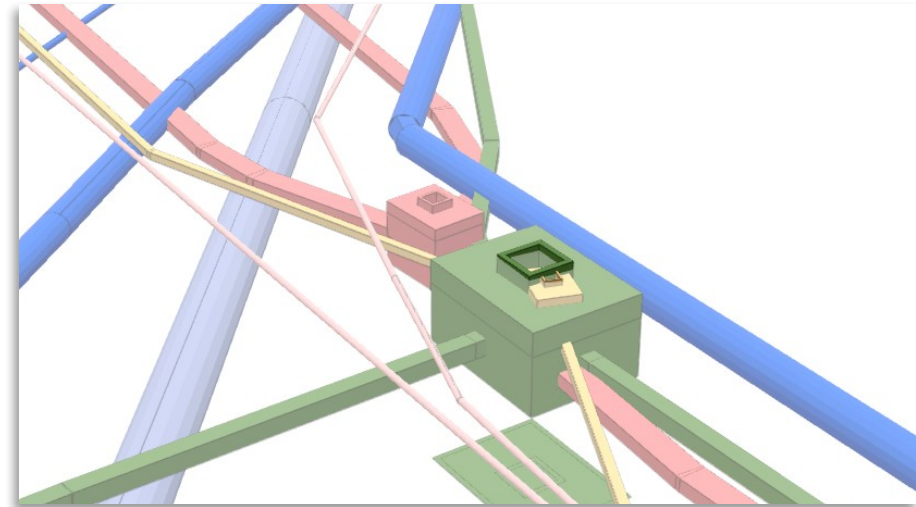
Potential time and cost avoidance from utility strikes arising from inaccurate services plans

# [Upcoming] GIS Map Services in Full 3D

For enhanced spatial analysis to aid planning design



3D | Necessary for detailed planning and design



- ✓ Easy to visualise spatial relationship to detect clashes and conflicting alignments
- ✓ Leads to accurate space planning and less abortive works downstream.
- ✓ Opportunities for automation by 3D analytics



To make Singapore a great city to live, work and play

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# THANK YOU!

