# Local Government Benchmark Study

Exploring the role of GIS technology in building a more advanced, resilient and sustainable Malaysia



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# CONTENTS

# GIS SUPPORTING TN50 AND BEYOND

## As we near the successful completion of our country's 2020 vision, it is important to reflect not only on how far we have come, but also look to the future, to plan the next evolution of Malaysia.

It is only by reflecting and learning – enabled through key pieces of research such as the *Local Government Benchmark Study* – that we can be ready to face the future.

This is a founding principle of the second phase of Transformasi Nasional 2050 (TN50). TN50 is a strategy that has been shaped by our citizen's aspirations to become a top 20 nation in economic development, social advancement and innovation. In order to meet this vision, we must embrace technologies – such as GIS – to ensure we can create smarter cities and more efficient processes.

As the findings of the *Local Government Benchmark Study* reveal, the broad use of GIS in this country has led to innovations that have had far-reaching social and economic benefits, helping ensure we are on track to hit the goals of TN50.

A key platform enabling the TN50 vision is the development of a National Spatial Data Infrastructure. The Malaysia Centre for Geospatial Data Infrastructure (MaCGDI) is leading public sector geospatial information sharing towards a spatially enabled government and society.

Through the Malaysia Geospatial Data Infrastructure (MyGDI) program, MaCGDI has taken the initiative to develop the Malaysia Geospatial Online Services (MyGOS) platform. The MyGOS objectives were to support government agencies that do not have GIS infrastructure, by providing them with free, online access to geospatial information and capabilities.

> "In order to meet this vision, we must embrace technologies – such as GIS – to ensure we can create smarter cities and more efficient processes."

It is anticipated that by opening access to this powerful technology, our cities and communities will be on track to operate more efficiently and achieve 'smart city' status by 2050. Many government agencies have already collaborated with MaCGDI to use the MyGOS platform – in fact there are more than 400 users across 14 government agencies.

I believe the future of Malaysia is strong – but it's a future that relies on the commitment and energy of our citizens in initiating change and technological disruption through platforms such as GIS. Only then can Malaysia achieve its vision of becoming a global powerhouse.

**Yang Berhormat Datuk Ir. Dr. Hamim Samuri**,
Deputy Minister, Ministry of Natural Resources and Environment (NRE)

# STRIVING TOWARDS A NATIONAL APPROACH TO GEOSPATIAL

## Whether it's transport, health, economic development or urban planning – geospatial information has become an essential resource for making our cities great places to live, work and play.

As the findings of the *Local Government Benchmark Study* attest, the demand for access to authoritative geospatial information in Malaysia's local government sector is growing.

This is at the heart of what we are trying to achieve at the Malaysian Centre for Geospatial Data Infrastructure (MaCGDI).

The MaCGDI's mandate is to lead public sector geospatial information sharing towards a spatially enabled government and society. Furthermore, we are commited to providing greater access to current and accurate geospatial data, to support a more sustainable living environment, economic growth and social progress for our community.

Key to achieving this vision is the Malaysia Geospatial Data Infrastructure (MyGDI) Program – the National Spatial Data Infrastructure that facilitates greater data sharing amongst our country's government and participating agencies.

Looking at the Benchmark Study, it was promising to note 65 per cent of participants had already joined the MyGDI program – and 94 per cent of these see GIS as essential to the future of the program.

> **"The ability to access and share authoritative information on a dynamic geospatial platform has led to innovations that have had far-reaching social and economic benefits in cities, not only here in Malaysia, but all around the world."**

MaCGDI – together with the support of Esri Malaysia – is pleased to deliver this study, which enables us to reflect on where our local governments are currently positioned, and where they are heading into the future.

By doing this, we hope to ensure local government participants can identify and better understand the various opportunities that lie ahead in embracing GIS technology and opening access to geospatial information.

**Hajah Norizam binti Che Noh**
Director of Malaysian Centre for Geospatial Data Infrastructure (MaCGDI)

Ministry of Natural Resources and Environment (NRE)

# A BRIGHT FUTURE FOR LOCAL GOVERNMENT AND THEIR COMMUNITIES

**In the Eleventh Malaysia Plan, Dato' Sri Mohd Najib bin Tun Haji Abdul Razak – Prime Minister of Malaysia – stated that productivity and innovation would be the key pillars for helping Malaysia become a truly advanced, inclusive and sustainable nation.**

Upon reviewing the findings of the *Local Government Benchmark Study*, it is clear this mandate has been readily embraced by the local government sector – with many turning to GIS technology to deliver truly innovative services that underpin a smarter, more efficient way of life.

Our decision to partner with MaCGDI to develop the Benchmark Study was part of a joint effort to shed light into not only how GIS technology is currently being used by local government – but to also explore the trends and demands for its growth into the future.

And for spatial technology, the future appears bright.

For example, in terms of green growth, 93 per cent of survey respondents deemed GIS technology as "essential" to creating a sustainable future.

Personally, I found it particularly compelling to learn the growing value local government places on GIS as a platform for community engagement.

93 per cent of survey respondents revealed they believe GIS can improve how they engage with citizens – a key finding which again speaks to the commitment of government at all levels to achieve greater inclusivity.

I trust you will enjoy reading the *Local Government Benchmark Study* as much as I have – and join me in congratulating our spatial industry colleagues within the local government sector on their commitment to using GIS for the betterment of their communities.

> **"From underpinning the planning and development of cities; to informing emergency response efforts – GIS technology has been identified by local government as fundamental to their day-to-day operations."**

**CS Tan**
CEO, Esri Malaysia

# INTRODUCTION

## ABOUT THE LOCAL GOVERNMENT BENCHMARK STUDY

**The *Local Government Benchmark Study* is the nation's first comprehensive report into the current and future role of Geographic Information System (GIS) technology in the country's local government sector.**

86 local government representatives participated in the research, which focused on the key areas of: sustainability, safe community initiatives, smart cities, policy development and future technology trends.

The research was conducted via an online survey that was open from June to July 2017.

This Report contains a detailed outline of the Study findings, including commentary on the role of spatial technology in the sector and best-practice examples of how local government authorities across Malaysia – and around the world – are already using GIS technology to better meet the needs of their communities.

The Study is a joint initiative of the Malaysian Centre for Geospatial Data Infrastructure (MaCGDI) and Esri Malaysia.

# LOCAL GOVERNMENT LANDSCAPE

**RESEARCH INSIGHT:**
The most common users of local government GIS services are the planning, building, engineering and property valuation departments.

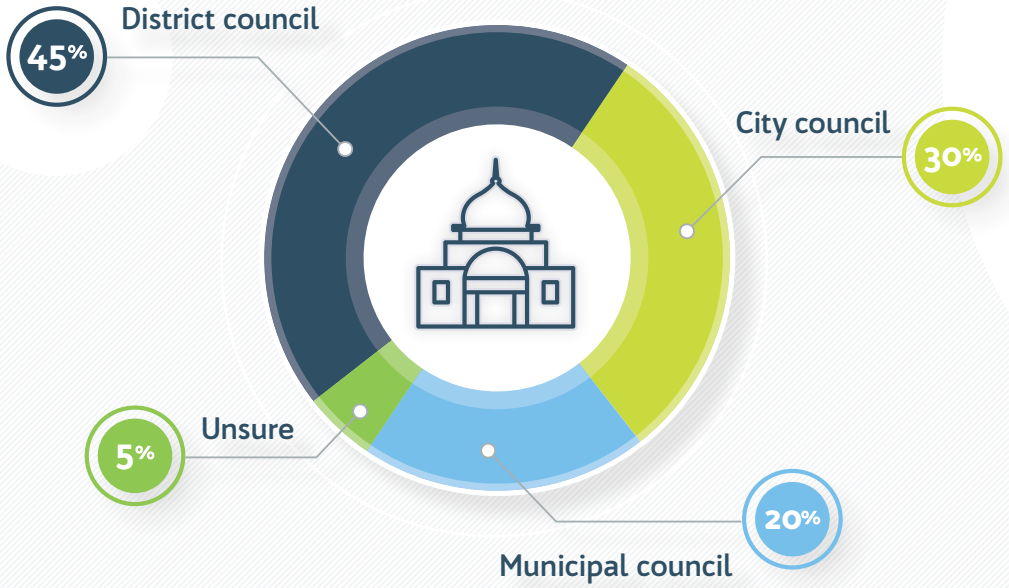
# Local government landscape

## IN TOTAL, 86 REPRESENTATIVES FROM 13 STATES TOOK PART IN THE STUDY.

*Authorities represented*

Question #1

# WHAT SIZE IS YOUR LOCAL GOVERNMENT JURISDICTION?




- ***45 per cent** of respondents came from district councils*
- ***30 per cent** came from city councils*
- ***20 per cent** came from municipal councils*

## DEFINITIONS

### City council

- Annual income is more than MYR100 million
- Population is more than 500,000

### Municipal council

- Annual income is more than MYR20 million
- Population is more than 150,000

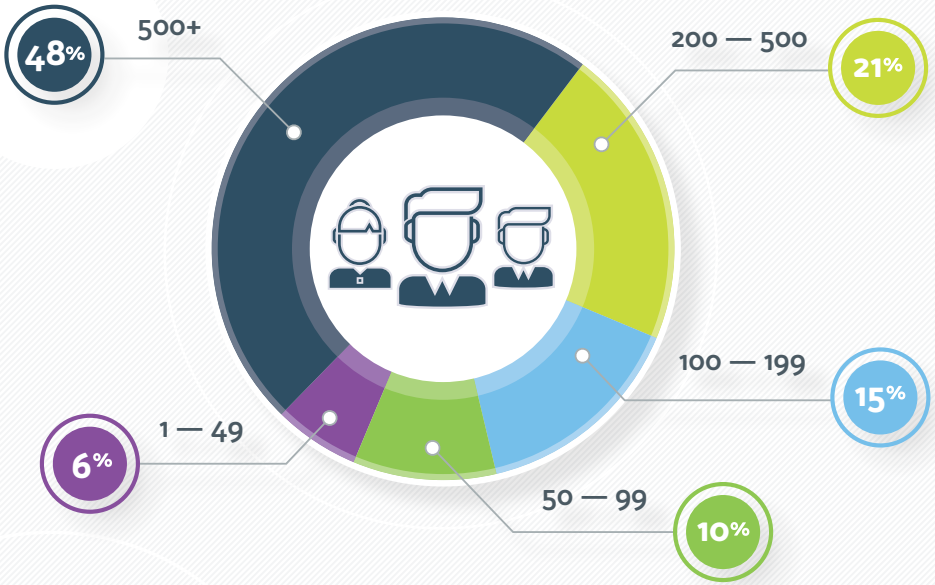
### District council

- Annual income is less than MYR20 million
- Population is less than 150,000

**Source:** *Kementerian Kesejahteraan Bandar, Perumahan Dan Kerajaan Tempatan (KPKT)*

Question #2

# HOW MANY STAFF DOES YOUR LOCAL GOVERNMENT EMPLOY?

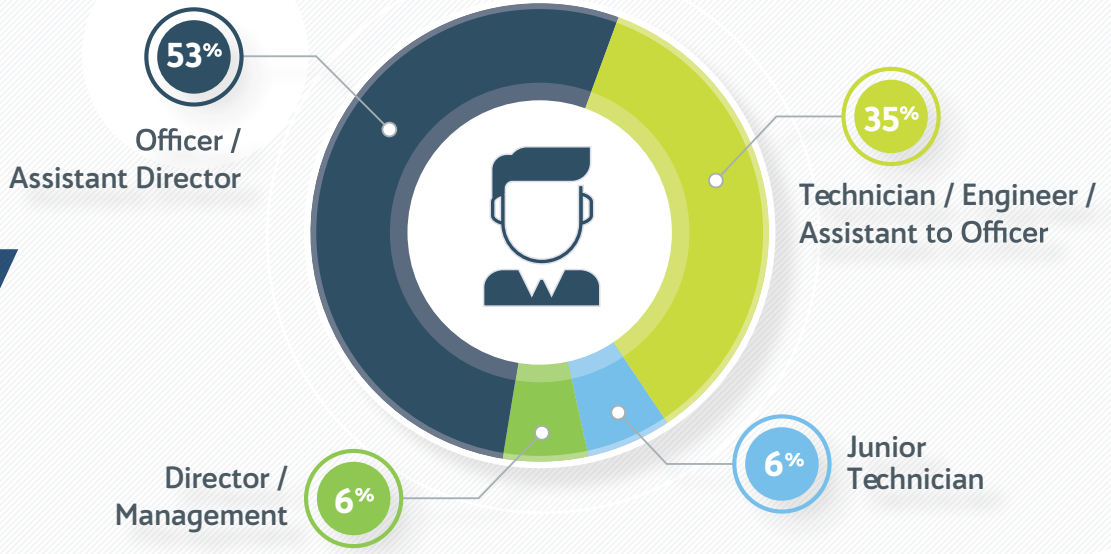



Local governments of varying size were represented. Almost half of respondents belonged to organisations with more than 500 employees.

Question #3

# WHAT IS YOUR POSITION LEVEL WITHIN YOUR ORGANISATION?

- More than half of respondents are in grade 41 – 54 positions (Officer or Assistant Director roles)
- Just over a third are grade 29 – 40 (Technicians, Engineers or Assistant to Officer)
- 6 per cent are in management, director or JUSA positions
- 6 per cent are grade 19 – 28 (Junior Technicians)

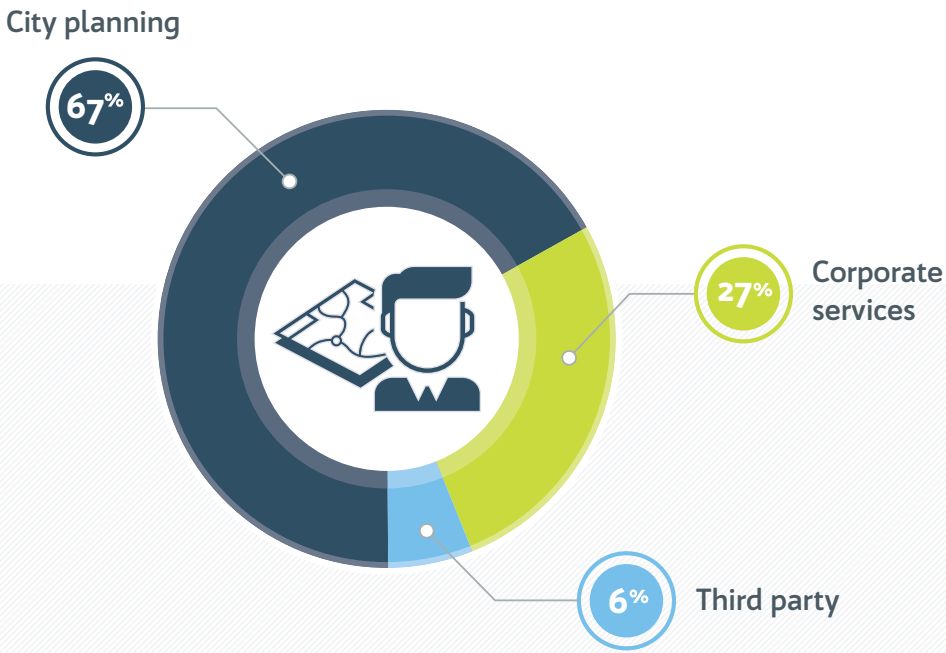


Question #4

# DOES YOUR LOCAL GOVERNMENT HAVE A DEDICATED GIS DEPARTMENT?

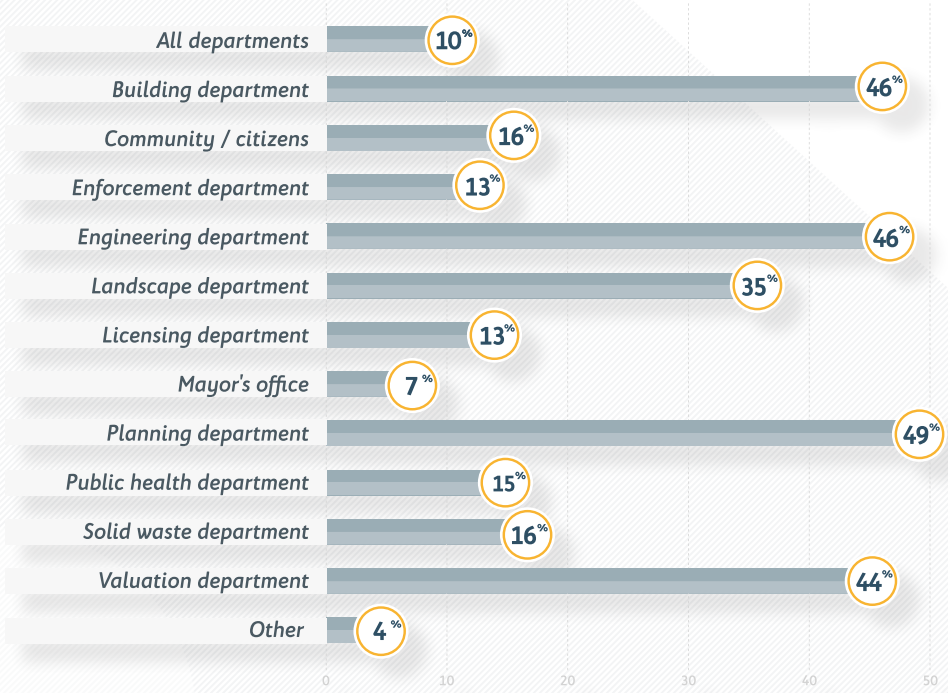

62 per cent of respondents have a GIS department within their organisation. For those without a dedicated GIS team, the majority indicated the GIS function falls within the city planning or corporate services department.

# IF THERE IS NO DEDICATED GIS DEPARTMENT, WHO MANAGES GIS IN YOUR ORGANISATION?



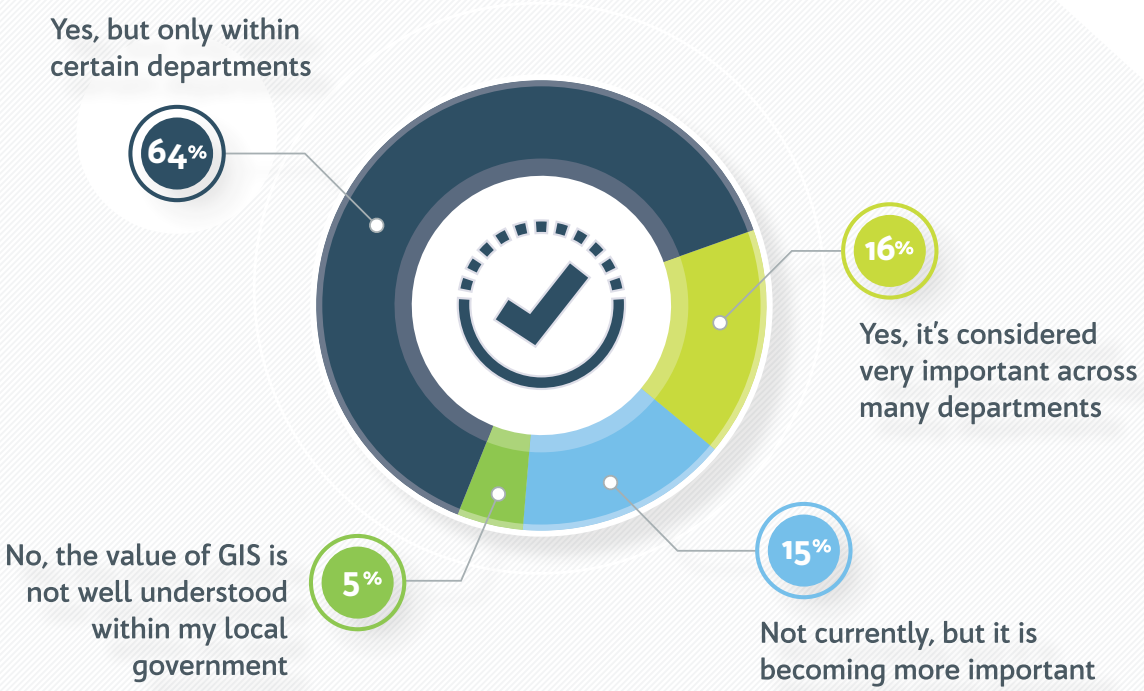
# WHO CURRENTLY USES YOUR LOCAL GOVERNMENT'S GIS SERVICES?

10 per cent of respondents indicated all departments within their organisation currently access GIS technology. The remainder indicated the most common users of their organisation's GIS services are the planning, building, engineering and valuation departments.




Question #6

# IS THE USE OF GIS TECHNOLOGY A PRIORITY FOR YOUR LOCAL GOVERNMENT?




> "GIS can be extensively used and is relevant to all interested departments."
>
> **Haryanti Abdul Rahman**,
> Architect, Iskandar Puteri City Council (MBIP)
> *Majlis Bandaraya Iskandar Puteri*
> Formerly known as Majlis Perbandaran Johor Bahru Tengah

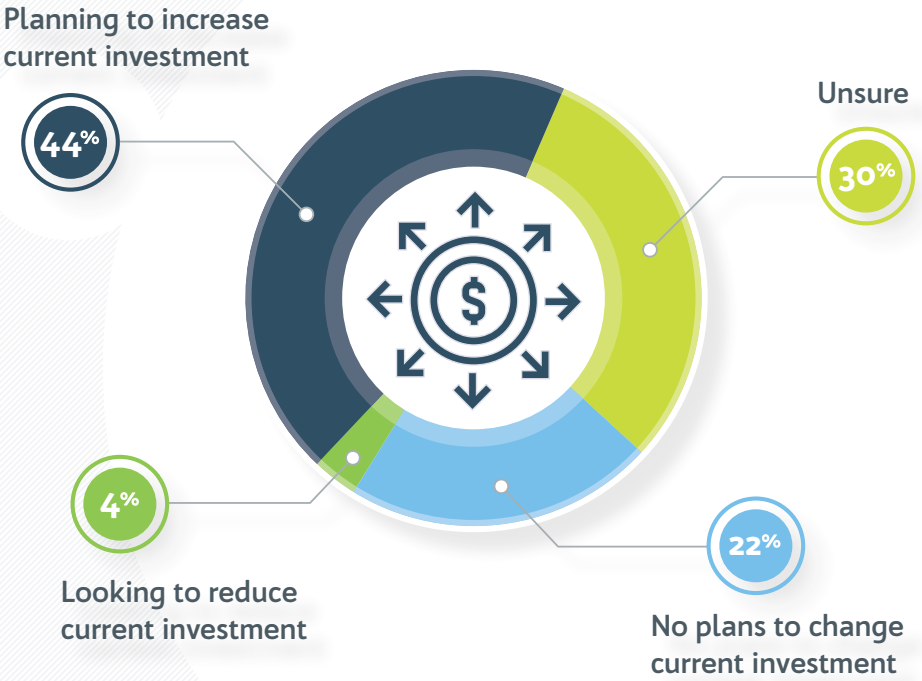
> "Announcements about its benefits are deficient."
>
> **Zulkifli bin Sabree**,
> City & Town Planning Officer, Tangkak District Council (MDT)
> *Majlis Daerah Tangkak*

**80%**
Think GIS is a priority

- 80 per cent of respondents believe GIS technology is a priority.
- A further 15 per cent indicated that while it's not currently a priority, it is becoming more important.
- 5 per cent believe the value of GIS is not well understood in their local government.

Question #7

# WHAT IS YOUR ORGANISATION'S PLANNED FUTURE INVESTMENT IN GIS TECHNOLOGY?

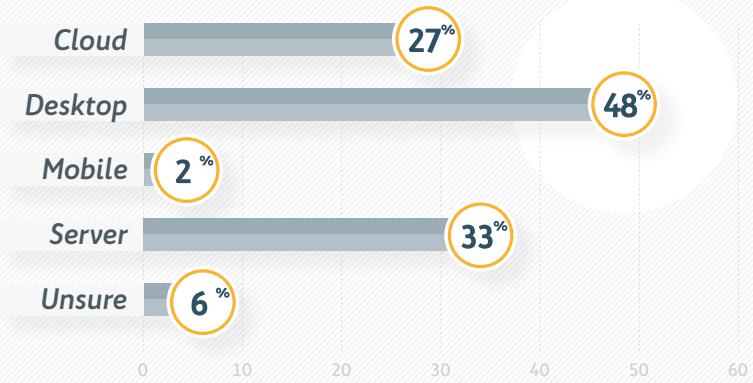



Almost half the respondents indicated their local government plans to increase their current GIS investment; while 22 per cent have no plans to change the current investment level.

**44%**
Will increase their investment in GIS

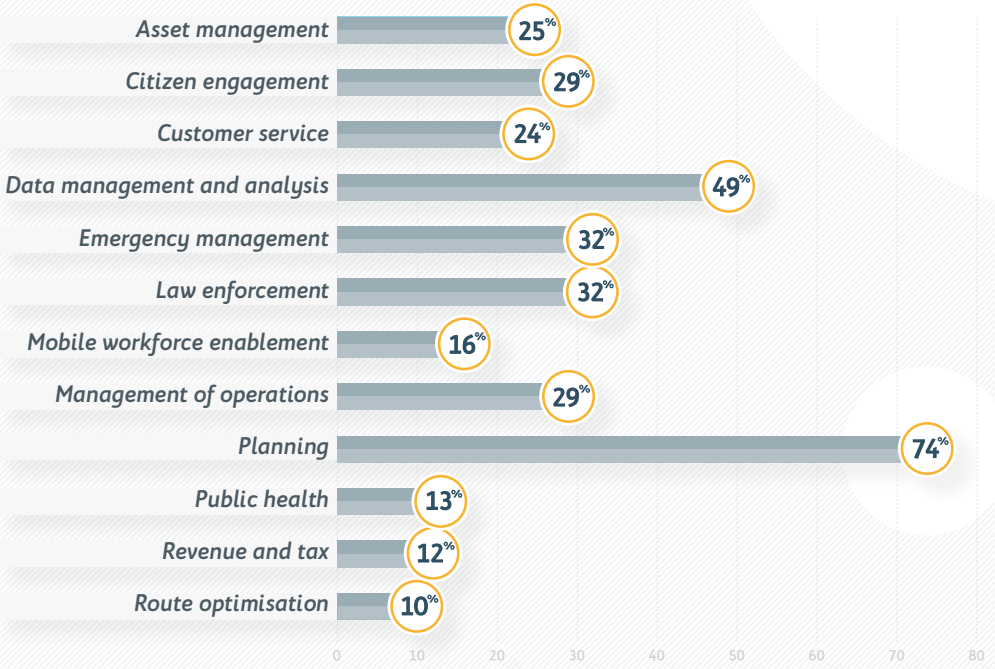
Question #8

# WHAT GIS PLATFORM(S) DOES YOUR LOCAL GOVERNMENT CURRENTLY USE?




The Study results indicate the majority of local governments utilise GIS across multiple platforms. For most, Desktop remains the primary platform, with Server and Cloud also being commonly used.

# FOR WHICH OF THE FOLLOWING PURPOSES DOES YOUR LOCAL GOVERNMENT USE GIS TECHNOLOGY?




**74%**
**Use GIS for planning**

Respondents indicated they use GIS technology for a broad range of purposes, with the most common being planning, data management and analysis. This is closely followed by emergency management, law enforcement, operational management and citizen engagement.

# PUTRAJAYA CORPORATION (PPj*)

**PPj has traditionally used GIS technology across its planning, valuation and engineering departments. Now, the local government authority is undertaking an innovative new project aimed at transforming the region into a truly smart city.**

At the heart of their digital transformation strategy is a GIS dashboard that integrates real-time surveillance footage with other live sensor data sourced from Internet of Things (IoT) technologies. The aim of the dashboard is to help the local government ensure greater community safety by reducing incident response times, allowing multi-data source monitoring, and facilitating more in-depth analysis and reporting.

In particular, the technology will be used to support the expansion of PPj's CCTV capabilities. Currently the Putrajaya area has 205 CCTVs, but this will soon increase to 400. If an emergency incident is reported, the system will send alerts to Putrajaya Command Centre advising them of the location and providing access to the relevant CCTV footage. There are also plans to ensure panic buttons located around the Putrajaya area are integrated with the GIS, so if an incident occurs the location is immediately known and the correct CCTV footage can be easily accessed.

Beyond this public safety initiative, PPj also intend to expand the use of GIS technology to their landscape department.

** Perbadanan Putrajaya (PPj)*

# ISKANDAR PUTERI CITY COUNCIL (MBIP*)

**Majlis Bandaraya Iskandar Puteri (MBIP) has been using GIS technology for 15 years, predominately to manage land use planning and zoning. In recent years however, the local government authority has undertaken a project to modernise and expand its GIS services.**

Specifically, MBIP is aiming to use GIS technology to establish a central data repository, to reduce current inefficiencies and duplication of efforts when employees are searching for scattered information. Phase One of the initiative is the "City Data Warehouse" project with the planning department.

Looking to the future, MBIP plans to continue expanding its use of GIS technology and services throughout the organisation in departments such as engineering, health and licensing, as well as to the public through online information maps.

Through expanding the use of GIS technology, MBIP intends to achieve new benefits including: improving efficiencies for the government's mobile workforce; establishing greater operational awareness across the organisation; and enabling more effective citizen engagement.

**Majlis Bandaraya Iskandar Puteri (MBIP) - formerly known as Majlis Perbandaran Johor Bahru Tengah*

# NEGERI SEMBILAN STATE GOVERNMENT

**Negeri Sembilan has been using GIS technology since 2003. Their flagship GIS platform – the *Negeri Sembilan Geographical Information System* (GIS9) – is a database which integrates the organisation's geospatial data to support and improve decision-making and data-sharing capabilities across all Negeri Sembilan government departments.**

The GIS9 project is an initiative of three Negeri Sembilan State Government agencies, specifically: PLANMalaysia@Negeri Sembilan, State Planning Economic Unit (UPEN*) and Information Technology Management Unit (UPTM**).

In 2015, Negeri Sembilan relaunched an updated and enhanced version of GIS9 to incorporate new capabilities in areas including: education planning, social services, development and planning, and land search.

The platform is now used to support key government priorities, such as urban planning (to highlight zoning and development trends) and for special projects such as the Burial Ground Database, Malaysia Vision Valley project, the management of quarry area and an action plan for Central Forest Spine (CFS).

Looking to the future, Negeri Sembilan plans to expand the use of GIS technology throughout its entire local government organisation, to ensure more departments and community members use the GIS9 application to support their daily work.

**Unit Perancang*
***Unit Pengurusan Teknologi Maklumat*

To achieve this vision and ensure GIS9 remains an efficient and effective platform, Negeri Sembilan has a GIS technical committee that meets quarterly to monitor and review the effectiveness of the platform in achieving its goal of broad usage.

## SEE GIS9 IN ACTION

**Click here to explore the maps and datasets Negeri Sembilan have made publicly available through GIS9.**

# SUBANG JAYA MUNICIPAL COUNCIL (MPSJ*)

**MPSJ is currently developing an executive information system (EIS) aimed at integrating data from across the organisation into one dynamic map-based application that can be accessed by key decision-makers and the public.**

The system will be developed using GIS technology, which the local government has been using since 2004.

The use of GIS has steadily grown within MPSJ over the years, starting from the technical departments such as the town planning, building and engineering departments – with town planning being the current largest user. It is MPSJ's expectation that the EIS will grow the role of GIS technology further for use throughout the entire organisation – and in particular to non-technical departments.

Looking to the future, MPSJ believes GIS will deliver significant benefit to both the government and broader public. For example, it will be used to monitor complaints and incidents in real-time so authorities can respond accordingly.

MPSJ also intends to leverage GIS technology for citizen engagement, and use by academias, NGOs and other agencies.

**Majlis Perbadanan Subang Jaya (MPSJ)*

# DIGITALLY TRANSFORMING THE BUSINESS OF LOCAL GOVERNMENT

**Brett Bundock**
Managing Director, Esri South Asia and Esri Australia groups

**Digital transformation is a concept that has been broadly discussed across the public sector, business and academia with its meaning evolving significantly over time.**

Today, for local government authorities, digital transformation involves taking advantage of advanced data analytics to deliver more intuitive services and smarter communities.

Fundamental to this is knowing how to extract and manage actionable intelligence from Big Data.

Looking at local government authorities around the world, you can see that GIS technology is increasingly being used as a key platform to do this.

GIS works with IoT technologies to map and analyse information from physical, connected devices – including smart devices, vehicles, cameras and satellites – to reveal a city's real-time pulse.

Using these data insights to improve service efficiency – from alerting law enforcement professionals about a crime as it unfolds, to intuitively managing traffic light signals to reduce road congestion – is what transforms conventional communities into truly smart cities.

But while the digital transformation of many metropolitan regions, such as Iskandar, Singapore and Los Angeles, is already well underway, for most local government authorities there remains some challenges.

Currently, 75 per cent of cities worldwide are not taking full advantage of smart city data and digital assets due to a lack of process, project management, and change management skills *(Source: International Data Corporation, 2016).*

The key to a successful digital transformation lies in mobilising the right technology and securing stakeholder buy-in at all levels of an organisation. If your organisational environment is unprepared or resistant to change, you may need to enlist the right expertise early in the stages to help your entire enterprise through the digital transformation process.

There are already a wide range of tools and resources available to help you get started. All it takes is the determination to succeed and some inventive spatial thinking.

> **"75 per cent of cities worldwide are not taking full advantage of smart city data and digital assets due to a lack of process, project management, and change management skills."**

# GREEN GROWTH AND SUSTAINABILITY

**RESEARCH INSIGHT:**
93 per cent of respondents believe GIS technology is essenssial when planning for a sustainable future.

# Green growth and sustainability

Question #10

## HOW IMPORTANT IS GIS TECHNOLOGY IN PLANNING FOR A SUSTAINABLE FUTURE?


All respondents indicated GIS technology is important when planning for a sustainable future – with 93 per cent deeming it 'essential'.

No survey respondents (0 per cent) deemed GIS as "not important" when planning for a sustainable future.

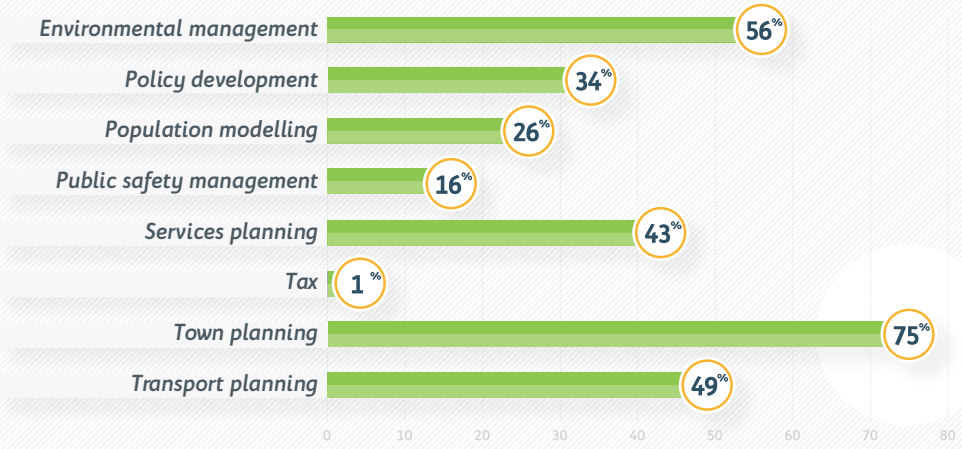
> "There are more [opportunities] to use [GIS technology] on planning control and development... It can also be extended to some other internal departments such as engineering, buildings, landscape, licensing or enforcement."
>
> **Haryanti Abdul Rahman,**
> Architect, Iskandar Puteri City Council (MBIP)
> *Majlis Bandaraya Iskandar Puteri*
> Formerly known as Majlis Perbandaran Johor Bahru Tengah

### DEFINITION

*The terms '**green growth**' and '**sustainable development**' refer to economic, planning and development initiatives that meet current community needs while protecting the interests of future generations.*

Question #11

# HOW DOES YOUR LOCAL GOVERNMENT LEVERAGE GIS TECHNOLOGY WHEN PLANNING FOR A SUSTAINABLE FUTURE?

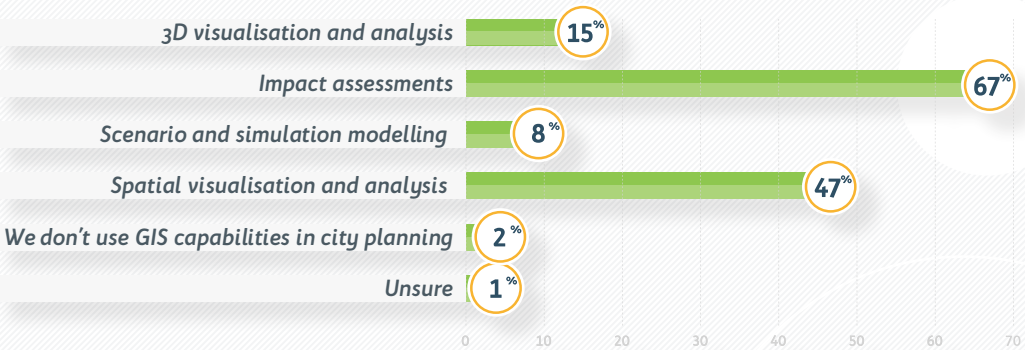



**75%**
**Use GIS for town planning**

Most respondents indicate they currently use GIS technology across multiple areas of their local government's green growth initiatives – with 75 per cent indicating it's used for town planning and more than half indicating it's used for environmental analysis.

Question #12

# WHAT GIS CAPABILITIES CURRENTLY SUPPORT YOUR CITY PLANNING INITIATIVES?




Impact assessment and spatial visualisation and analysis are the most common ways GIS technology is used to support planning and development initiatives, followed by 3D visualisation and analysis and scenario or simulation modelling.

# INNOVATION FUELS COMMUNITY SAFETY AND SUSTAINABILITY

## Kuala Lumpur City Hall (DBKL*)

**Kuala Lumpur is famous for its rolling landscape, but the city's unique topography – and the risks that come with it – have prompted the local government to identify innovative ways to ensure the long-term safety of its communities.**

Approximately 54 per cent of Kuala Lumpur's residential area is located among the city's many hills, which creates significant planning challenges. Soil conditions vary between suburbs and the incidence of fatal landslides has traditionally hampered real estate development and economic opportunities for the city.

In an effort to safely guide future property developments, planners from DBKL used GIS technology to develop the Kuala Lumpur Slope Information System (KuLSIS) – a platform which provides detailed insight into the city's topography and the correlating development ramifications. The system integrates a broad range of datasets to produce a dynamic 3D map of the city that urban planners can use to conduct hazard and risk assessments.

KuLSIS also provides insight which enables planners to quickly identify dangerous terrain and prevent the negative effects of a landslide. This is achieved through analysing key factors including: signs of distress, failure history, slope angle, flow accumulation, geological lineament, rainfall, geology and land cover, with the results ranked by level of hazard and risk – from very low to very high. The analysis provides urban planners with compelling 3D visualisations of locations most vulnerable to geological hazards, and highlights areas unfit for future residential and commercial establishments.

In addition to helping DBKL officials identify ideal locations for new developments, KuLSIS has also practically eliminated the previous two-week wait time for terrain data processing. With data instantly accessible, local authorities can now make fast, informed decisions on which infrastructure is suitable for specific areas and what preventive measures need to be put in place to ensure public safety and ongoing sustainability for Malaysia's largest city.

> **"The analysis provides urban planners with compelling 3D visualisations of locations most vulnerable to geological hazards, and highlights areas unfit for future residential and commercial establishments."**

**Dewan Bandaraya Kuala Lumpur (DBKL)*

# MEASURING WALKABILITY FOR A CLEANER FUTURE

## Future Cities Laboratory, Singapore

**The Future Cities Laboratory (FCL) – a research centre focused on creating sustainable, green cities – has used GIS technology to assess Singapore's current walkability and evaluate strategies to improve walking conditions in the future.**

A city's walkability level is based on how accessible and friendly it is for walkers. It includes how the quality of the urban environment influences people's decisions on whether to travel on foot or take a car or other mode of transport. Assessing walkability is an increasingly popular initiative to help ensure cities grow and prosper in an environmentally conscious and efficient manner.

FCL's project – undertaken in collaboration with Singapore's Urban Redevelopment Authority – used GIS technology to analyse the current pedestrian environment with observations of actual pedestrian behaviour, to reveal new insights into walking behaviours.

Planners examined details on the quality of sidewalks, shade availability and presence of obstructions, as well as considerations that are harder to measure, such as the extent to which physical elements cater to the volume of pedestrians and the speed at which they walk.

Based on these findings, a walkability index was created to measure how useful, comfortable and interesting it is to walk through certain areas and streets.

"At the end of the study, we determined if people's perception of distance is affected if they are exposed to interesting sights while walking," said Michael van Eggermond, a PhD researcher at FCL. "In addition, other variables such as the width of sidewalk, presence of shade, lighting and presence of shops among others also contribute to a city's walkability."

Apart from measuring walkability, FCL also examined how infrastructure for cyclists in urban cities is perceived. 3D GIS technology was used to effectively model Singapore's streets and analyse the demand for cycling infrastructure.

Ultimately, the solution has provided planners with a more holistic view of factors that make cities safer and healthier for citizens.

> **"Variables such as the width of sidewalk, presence of shade, lighting, and presence of shops among others also contribute to a city's walkability."**
>
> **Michael van Eggermond,**
> PhD researcher, Future Cities Laboratory

# CHARLOTTE'S GREEN CITY TOUR

## City of Charlotte, United States

**To deliver on its commitments of environmental stewardship, the City of Charlotte developed the 'Charlotte Green Tour' – an interactive mapping application that shares information relating to the government's ongoing sustainability initiatives.**

From encouraging citizens to swap driving on the roads for walking the city's pedestrian network, to providing businesses with information relating to the environmental practices of green buildings – the map highlights more than 600 green assets across areas including energy, water, solid waste, transportation, and parks and green spaces.

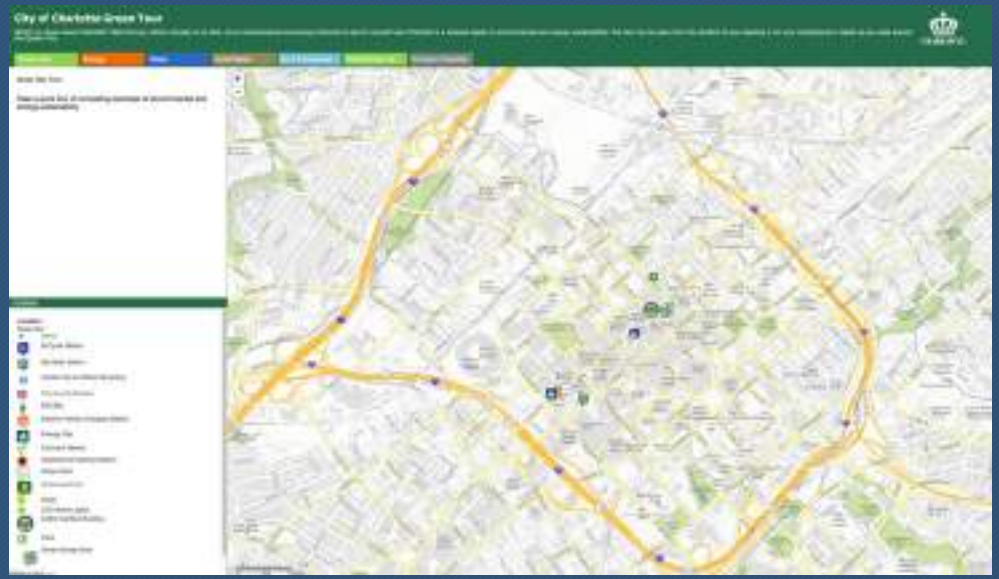
The City of Charlotte partnered with several agencies and organisations – including Mecklenburg County, Duke Energy, Bank of America, and Davidson College – to ensure the application contained broad and detailed environmental insights.

Representatives from the City's Office of the Chief Information Officer (OCIO), the City Manager's Office, and Mecklenburg County planned the data collection effort which took advantage of smart devices to capture images and coordinates.

The result is a visually appealing, user-friendly map that enables any member of the community to quickly understand the city's green initiatives – and identify how they can get involved.

## SEE THE GREEN TOUR APP IN ACTION

**What's so green about Charlotte? Click here to take the tour to see for yourself why Charlotte is a global local government leader in environmental and energy sustainability.**



# SAFE COMMUNITIES

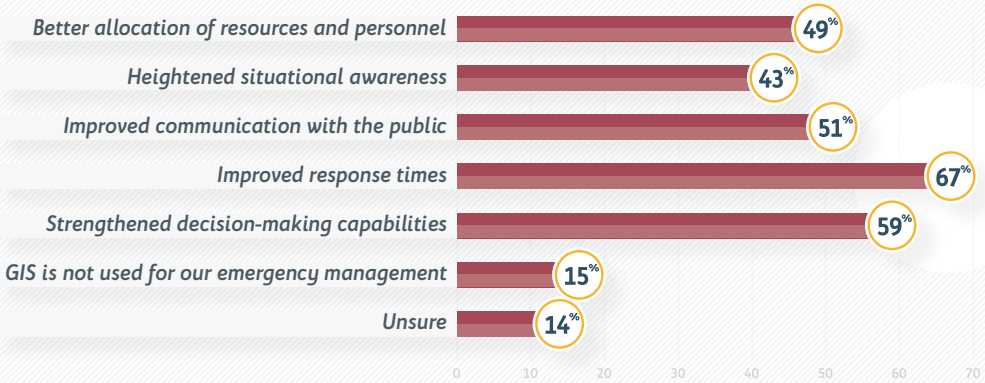
**RESEARCH INSIGHT:**

48 per cent of respondents indicated crowdsourced information is important to their emergency management and response activities.

# Safe communities

Question #13

## WHAT BENEFITS DOES YOUR LOCAL GOVERNMENT RECEIVE FROM UTILISING GIS TECHNOLOGY IN AN EMERGENCY?




### The most common benefits GIS technology delivers during an emergency are:

- Improving response time (67 per cent)
- Strengthening decision-making capabilities (59 per cent)
- Improving communication with the public (51 per cent)
- Ensuring effective allocation of resources and personnel (49 per cent)

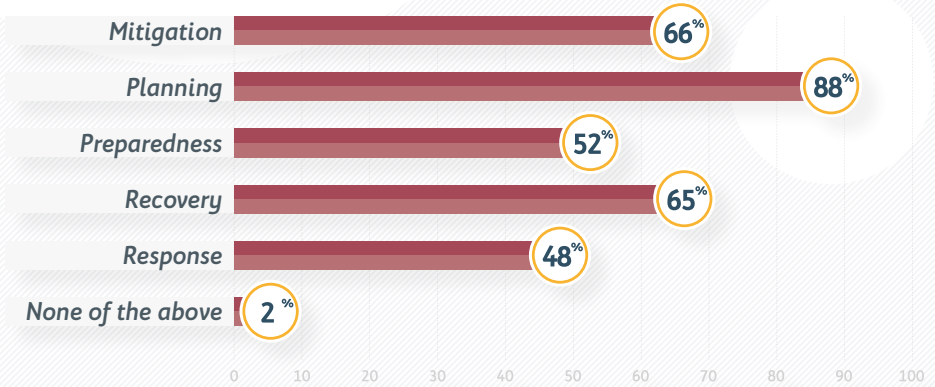
### DEFINITION

*For the purposes of this report, a 'safe community' is one in which all sectors of the community work together in a coordinated and collaborative way, forming partnerships to mitigate risk, increase the overall safety of its members and reduce the fear of harm.*

**85%**
Use GIS to support emergency services

Question #14

# IN TERMS OF EMERGENCY MANAGEMENT, WHERE DO YOU BELIEVE GIS TECHNOLOGY CAN ADD VALUE?



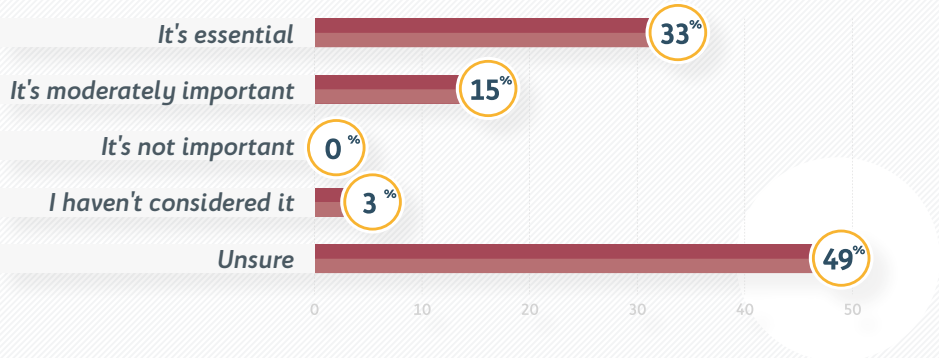

98 per cent of respondents believe GIS technology can add value to emergency management, with supporting planning, mitigation and recovery efforts rating highest.

## DEFINITION

*For the purpose of this report, crowdsourced information is defined as data obtained directly from the public, usually via mobile devices in real-time.*

Question #15

# HOW IMPORTANT IS CROWDSOURCED INFORMATION TO YOUR LOCAL GOVERNMENT'S EMERGENCY MANAGEMENT AND RESPONSE ACTIVITIES?




48 per cent of respondents indicated crowdsourced information plays an important role in emergency management and response activities – with a further 33 per cent deeming it essential.

# SAFE-GUARDING MALAYSIA AGAINST FUTURE FLOODS

## Department of Irrigation and Drainage, Ministry of Natural Resources and Environment (JPS*)

**In late 2014 and early 2015, heavy rains and high river flows caused severe flooding and landslides along the east coast of Peninsular Malaysia, resulting in loss of lives and property.**

To reduce ongoing damages and protect members of the public from future destructive flooding events, the Department of Irrigation and Drainage (JPS) developed a Flood Forecasting and Warning System (FFWS).

FFWS leverages GIS technology to provide real-time flood and disaster information to government agencies, emergency responders and members of the community alike.

The portal contains detailed information on topics such as real-time river water levels, flood levels, recorded rainfall, flood camera and flood maps. It is also used to provide highly accurate flood forecasts to authorities (up to seven days ahead of a flood event) and the public (up to three days ahead) – to ensure proper planning and preparation efforts are in place to prevent causalities and mitigate flood damage.

**Jabatan Pengairan dan Saliran, Kementerian Sumber Asli dan Alam Sekitar (JPS)*

# LOCATING FASTER EMERGENCY RESPONSE TIMES

## Emergency Medical Services, Singapore

**Emergency Medical Services (EMS) is a Singaporean government agency that oversees the coordination of medical personnel, facilities, and equipment to ensure healthcare services are efficiently delivered.**

To better understand the impact ambulance response times have on mortality and morbidity rates, EMS analysed ambulance response trends and patterns in partnership with researchers from the Singapore General Hospital, SingHealth, the Singapore Civil Defence Force (SCDF), and the National University of Singapore School of Public Health.

Using GIS technology, the researchers uncovered some valuable insights, such as most daytime ambulance request calls come from the commercial and business districts, while calls at night are typically from residential areas.

These insights were visually represented on a dynamic map to clearly show stakeholders the location of demand hotspots and the location of the nearest ambulance services. This served to highlight where there may be service gaps or room to increase efficiencies.

The technology was also used to project ideal travel times when responding to incidents and a correction factor was computed based on the ratio of historical ambulance travel time to the ideal travel time.

The findings suggested that more ambulances be pre-emptively positioned near activity hotspots at peak times. By doing so, ambulances can get to emergencies more quickly.

# ENSURING SAFE PASSAGE FOR JAKARTA'S PILGRIMS

## Ministry of Transportation, Indonesia

**Indonesia's annual Idul Fitri exodus is the world's biggest voluntary migration. It's a period of celebration which sees millions of travellers leave Jakarta to return to their native homes.**

During this busy, festive period, Indonesia's Ministry of Transportation ('MOT') uses GIS technology to capture and analyse real-time data feeds from social media platforms such as Facebook and Twitter, to help local authorities better respond to traffic chaos and accidents.

By using GIS to visualise the location of issues and potential issues, MOT can ensure a safer and more orderly journey for travellers.

# RAISING TSUNAMI AWARENESS TO IMPROVE PREPAREDNESS

## New South Wales State Emergency Service, Australia

**The New South Wales State Emergency Service (NSW SES) is responsible for responding to and planning for crises throughout the state. Part of this work includes raising community awareness around the threat of tsunamis, as well as coordinating response in the wake of such an event.**

To help build preparedness and community resilience, the agency launched *TsunamiSafe*: a community-based initiative providing NSW SES, other agencies and citizens with the necessary tools and information they need to make more informed decisions both prior to and during a tsunami.

Recognising the value interactive maps have in helping visualise and communicate the potential impacts of a tsunami, the agency used GIS technology to develop two key applications to support the *TsunamiSafe* initiative.

One tool – the *Evacuation Mapping Application* – is a public-facing map that provides the community and other agencies with insights on areas vulnerable to a land-threat tsunami. The map collates various data sources to display reliable information on areas likely to be affected and where higher ground can be found. The insights aim to benefit both the community and emergency responders.

The other tool – a *TsunamiSafe* story map – educates the public on tsunamis and the dangers they pose. The story map combines authoritative maps about the impacts of tsunamis in NSW with narrative text, images and multimedia content to create an educational tool that enables the public to better prepare for potential tsunamis.

## SEE THE TSUNAMISAFE APPS IN ACTION

Click here to see how GIS can communicate critical tsunami information, explore the Evacuation Map and TsunamiSafe Story Map apps now.

# SMART, CONNECTED CITIES

**RESEARCH INSIGHT:**

93 per cent of respondents believe GIS can improve how government engages with citizens.

# Smart, connected cities

Question #16

## DOES YOUR LOCAL GOVERNMENT CURRENTLY USE GIS TO COMMUNICATE INFORMATION TO CITIZENS?


More than half of respondents indicated their organisation already uses GIS to communicate information to the public.

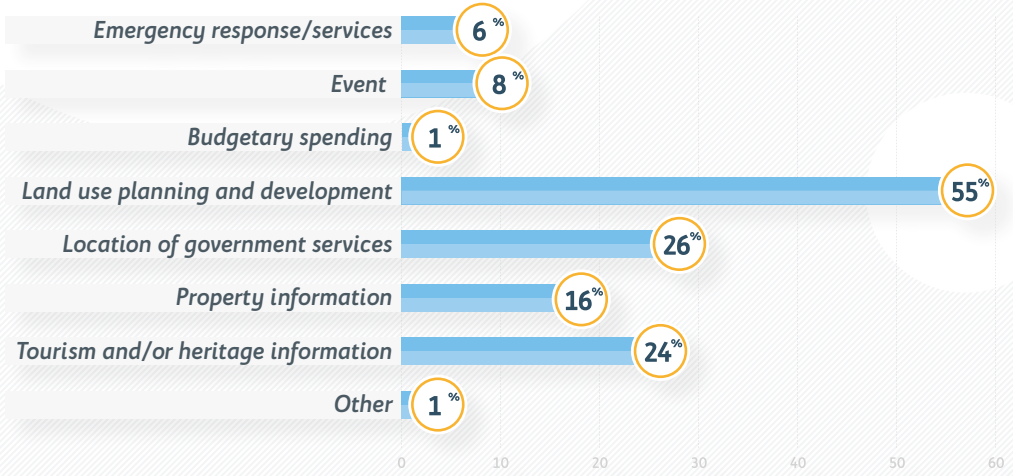
> The public can use GIS technology to search for information more easily, quickly and transparently.
>
> **Haryanti Abdul Rahman,**
> Architect, Iskandar Puteri City Council (MBIP)
> *Majlis Bandaraya Iskandar Puteri*
> Formerly known as Majlis Perbandaran Johor Bahru Tengah

### DEFINITION

*For the purpose of this report, 'smart cities' are those where people and processes are connected with technology to achieve better daily outcomes and improve quality of life.*

Question #17

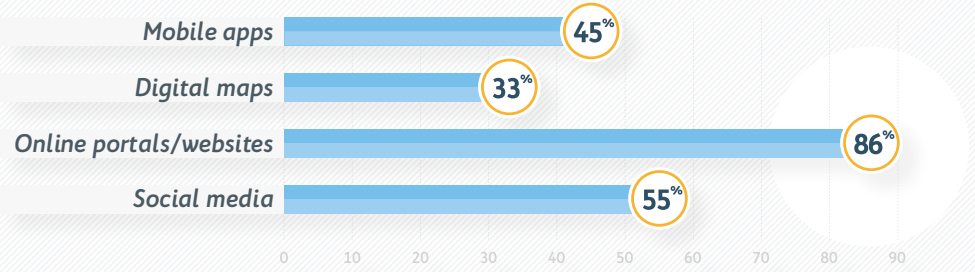
# WHAT INFORMATION DOES YOUR LOCAL GOVERNMENT CURRENTLY SHARE WITH THE PUBLIC VIA GIS APPLICATIONS?




- More than half the respondents indicated their council currently uses GIS technology to publicly communicate land use planning and development updates
- A quarter of local governments surveyed also use GIS to share the location of government services and tourism and heritage information.

Question #18

# WHICH ONLINE TOOLS DOES YOUR LOCAL GOVERNMENT CURRENTLY USE TO ENGAGE CITIZENS?




86 per cent of respondents provide their communities with access to online portals and websites. More than half also engage citizens through social media.

Question #19

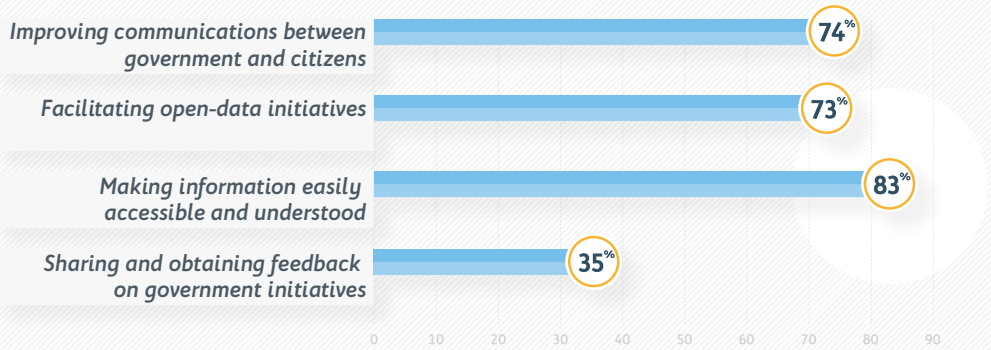
# CAN GIS TECHNOLOGY IMPROVE HOW YOUR LOCAL GOVERNMENT ENGAGES WITH CITIZENS?

> "In future, GIS will be commonly used to serve the public better, faster and more effectively which is parallel to the 'smart city' concept. For example [in addressing] flooding issues, traffic jams, managing government events, resolving public complaints and so on."
>
> **Young Woo Soon,**
> Engineer, City Council of Panang Island (MBPP)
> *Majlis Bandaraya Pulau Pinang*


**93%**
Believe GIS supports citizen engagement

Question #20

# HOW CAN GIS HELP IMPROVE CITIZEN ENGAGEMENT EFFORTS?




83 per cent of respondents believe GIS technology makes information more easily accessible and understood, and almost three quarters of respondents see it as important for improving communications between government and citizens and facilitating open data initiatives.

**83%**
**Believe GIS makes information easily accessible**

> "It facilitates and strengthens daily tasks for local government."
>
> **Marilyn Damian Majakul,**
> Senior Assistant Evaluation, Penampang District Council (PDC)
> *Majlis Daerah Penampang*

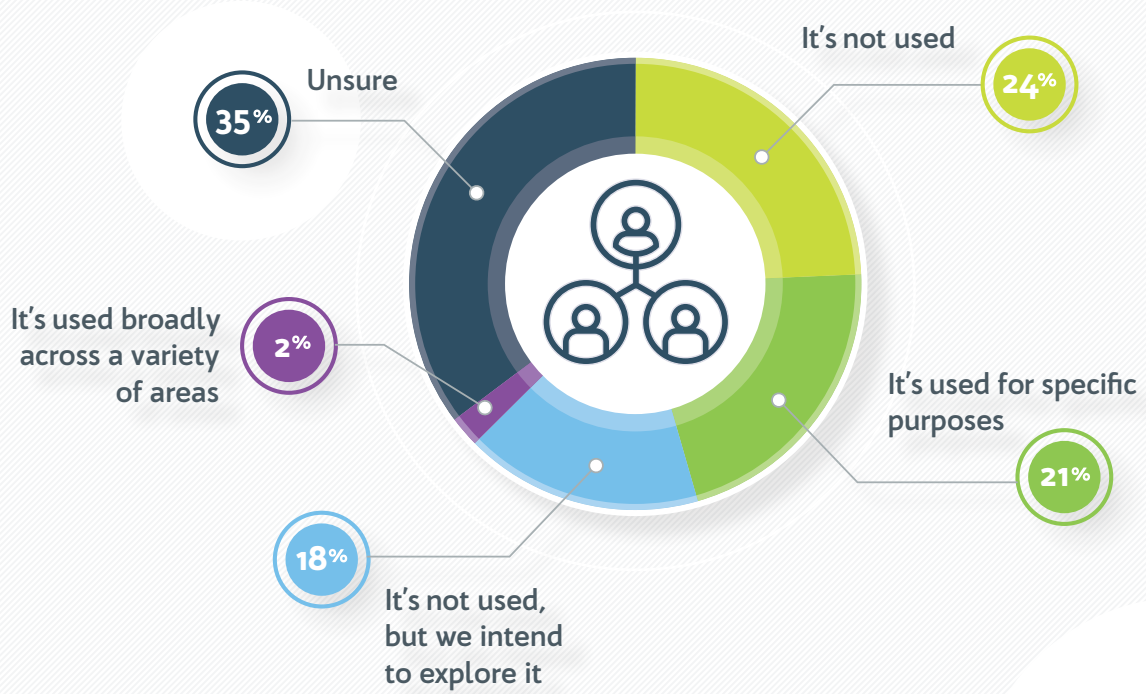
> "Announcements of local government information."
>
> **Zulkifli bin Sabree,**
> City & Town Planning Officer, Tangkak District Council (MDT)
> *Majlis Daerah Tangkak*

> "Get feedback on current land use from residents."
>
> **Umi Zuhirah binti Ramlan,**
> Assistant City Planning Officer, Kuala Selangor District Council (MDKS)
> *Majlis Daerah Kuala Selangor*

Question #21

# TO WHAT EXTENT DOES YOUR LOCAL GOVERNMENT USE CROWDSOURCED* INFORMATION?

23 per cent of respondents indicated crowdsourced information is already used by their local government. 18 per cent indicated while it's not currently utilised, their organisation intends to explore it.




* See definition - page 36

# THE SMART CITY PLAN PLACING MALAYSIA ON THE WORLD MAP

## Iskandar Regional Development Authority (IRDA)

**Iskandar Malaysia's goal of becoming a world-class smart city by 2025 is well documented – but what's not as widely known is the critical role GIS technology holds in helping ensure the region achieves its vision.**

GIS underpins the design, promotion and development activities of the Iskandar Regional Development Authority (IRDA), acting as a crucial decision-making platform that helps IRDA assess the wide-reaching impact of their initiatives.

Datuk Ismail Ibrahim, IRDA Chief Executive, said GIS technology enables their urban planners, economic managers and other key decision-makers to design smarter developments.

"Iskandar Malaysia was designed with investors in mind, as such deciding where to put up facilities, commercial and residential areas, and theme parks all requires impeccable planning and design," said Datuk Ismail

"By using GIS, we get a holistic view of our socio-economic environment enabling us to assess the various elements that might affect Iskandar Malaysia's business environment and the overall liveability of communities."

In the third development phase of Iskandar Malaysia, the agency has also announced a collaborative project to create the Iskandar Malaysia Urban Observatory (IMUO) – a four-year project that will use GIS technology to enable evidence-based spatial planning and policy-making.


Prof. Emeritus Dato' Dr. Ibrahim Komoo, Chairholder of Kursi @ UTM; Tan Sri Abdul Halim Ali, Chairman of UTM; Datuk Bazlan Osman, Group Deputy Chief Executive Officer TM Berhad; Datuk Ismail Ibrahim, Chief Executive of IRDA; YAB Datuk Seri Mohd Najib Tun Razak, Prime Minister; YAB Dato' Mohamed Khaled Nordin, Menteri Besar of Johor; Prof Ir. Dato' Dr. Wahis Omar, Vice Chancellor of UTM; Tan Choon Sang, Chief Executive Officer of Esri Malaysia Sdn Bhd; and, Hazmi Yusuf, Managing Director, Frost and Sullivan Perunding Strategi Sdn Bhd

> **"By using GIS, we get a holistic view of our socio-economic environment enabling us to assess the various elements that might affect Iskandar Malaysia's business environment and the overall liveability of communities."**
>
> **Datuk Ismail Ibrahim,**
> Chief Executive, IRDA

# A SMART TRANSPORT STRATEGY THAT GROWS WITH THE NATION


## Land Transport Authority, Singapore

**Faced with unprecedented demand for its transport services due to a rapidly growing population and tight land constraints, Singapore's Land Transport Authority (LTA) unveiled a master plan aimed at doubling the nation's rail network by 2030.**

To accurately forecast travel demand for the project, planners used GIS technology to analyse the commuter and smart sensor data collected daily by the LTA and other government agencies, to uncover compelling insights into Singaporean's car, bus and train travelling patterns.

The technology provides decision-makers with a common understanding of potential issues and constraints, enabling them to optimise the utilisation of transport infrastructure by prioritising investments, determining trade-offs among competing demands, and introducing new mechanisms to influence travellers' behaviours.

It allows the authority's planners to map and analyse hotspots with persistent heavy passenger loads during peak hours, and to study commuter travel patterns and behaviours.

In addition to influencing policy decisions, these insights are used to inform and engage town councils and community leaders on improvement measures.

The program has seen the Singaporean government roll out S$1.1 billion in bus service improvements, including an additional 1,000 buses to address overcrowding and frequency of service issues.

As a result, LTA has achieved a 90 per cent reduction in persistently crowded bus services and reduced average wait times by three-to-seven minutes. This is despite an increase of more than 100,000 commuters annually.

Ultimately, by leveraging GIS technology, LTA has been able to keep in front of Singapore's ever-changing public transport challenges to ensure the nation remains one of the world's leading smart cities.

# PLANNING FOR SMART, RAPID GROWTH

## City of Bekasi, Indonesia

**With a vision to achieve a smart city status within a decade, Bekasi City's planning agency has turned to GIS technology to support the development of thriving residential communities and business and industrial estates.**

As one of the fastest growing cities in Indonesia, Bekasi has attracted private investments to fund the development of public roads and highways, residential communities, shopping malls, and factories and industrial hubs.

Because of this fast-paced development, the planning agency identified the need for a secure and scalable technology platform that could improve decision-making and streamline workflows, especially in terms of issuing building permits.

GIS technology was selected to create a system that integrates and analyses data from various authoritative sources – such as the Geospatial Information Agency and the Ministry of Agriculture and Spatial planning – on to a single dynamic mapping platform.

The technology uncovers land use trends and provides planners with quick access to information – such as field surveys, parcel maps, aerial photos, and other relevant planning information – to support policy decisions regarding future developments in the community.

It also improves inter-departmental collaboration, allowing Bekasi planners to easily coordinate their planning and economic development initiatives.

# A HUB OF INNOVATION

## City of Los Angeles, United States

**Managing daily operations and providing effective services in a city as large as Los Angeles is a difficult task. As such, when LA Mayor Eric Garcetti first took office, he pledged to use data and technology to drive all government decisions and deliver greater transparency, efficiency and community engagement.**

The result was GeoHub, which uses GIS technology to integrate more than 500 datasets into a centralised business intelligence system. It allows staff, the public, and outside agencies to access, visualise, and analyse real-time data relating to the city's operations. City departments, the county, state, and federal government all contribute data, with plans for non-profits and universities to also contribute to the growing knowledge bank.

Just three months after launching the hub, Mayor Garcetti said Los Angeles had already unlocked important insights into public safety, infrastructure, and quality of life.

"Public safety personnel can make critical, real-time decisions based on solid, map-based data," said Mayor Garcetti. "If a firefighter with an iPad or a mobile device is called to respond to an emergency like an earthquake, then thanks to GeoHub, they could just pull up more than the 911 data for that call. They could find important facts, like building inspection status, location of the nearest fire hydrants, sewer lines, streetlights – any information that would make it easier to respond to an emergency."

> **GeoHub will help us reinvent the way that we deliver services and broaden our ability to engage residents and businesses to improve the quality of life in their city.**
>
> **Eric Garcetti,**
> Mayor, City of Los Angeles

# A WORLD-LEADER IN DIGITAL TRANSFORMATION

## Dubai, United Arab Emirates

**Smart Dubai, the government agency leading Dubai's digital transformation, is using GIS technology to underpin its Dubai Pulse smart city application.**

Dubai Pulse uses GIS technology to provide more than 44 government entities with intuitive and secure services and tools including dashboards, mobile apps and analytics capabilities.

"Dubai Pulse acts as a digital aggregator for all of Dubai's data, allowing leaders and stakeholders in all sectors across Dubai to easily access impactful information and data to assist in everyday business planning and overall city management," said Her Excellency Dr. Aisha Bin Bishr, Director General of the Smart Dubai Office.

"The platform is open for the public and private sector to contribute to and build, helping enhance the city's ability to analyse data, expedite decision-making, and innovate accordingly."

The City of Dubai hopes the adoption of the Dubai Pulse platform will carry the city forward as a world leader in digital transformation and smart city initiatives. It will be used to support key government initiatives, including: identifying transport issues, such as traffic accident hot spots; increasing citizen engagement in planning projects through the sharing of realistic 3D models; and, assisting with sustainability initiatives including solar energy generation.

> **"The platform is open for the public and private sector to contribute to and build, helping enhance the city's ability to analyse data, expedite decision-making, and innovate accordingly."**
>
> Her Excellency Dr. Aisha Bin Bishr,
> Director General, Smart Dubai Office

# POLICY DEVELOPMENT

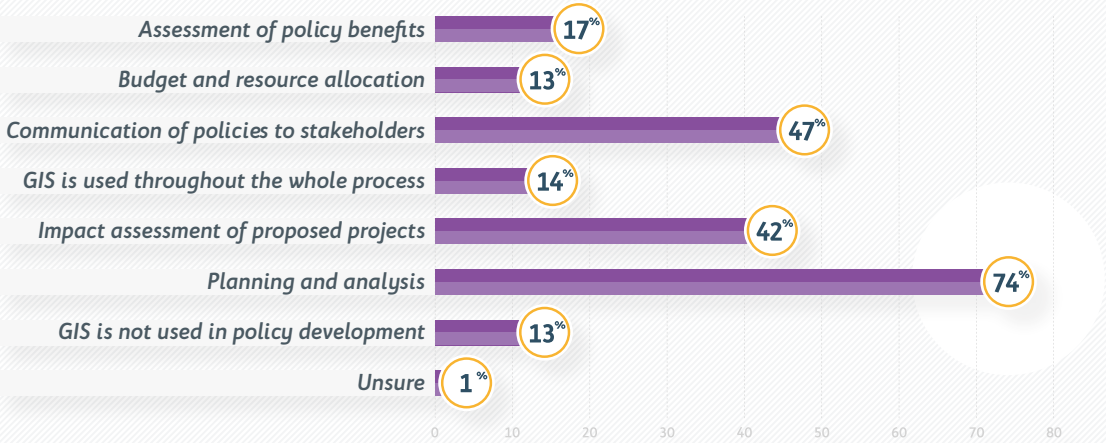
**RESEARCH INSIGHT:**

74 per cent use GIS to plan and analyse their local government policies in the development phase.

# Policy development

Question #22

## WHAT ROLE DOES GIS PLAY IN THE DEVELOPMENT OF YOUR LOCAL GOVERNMENT'S POLICIES?




**86%**
Use GIS for policy development

- Three quarters of respondents indicated that GIS holds a role in the planning and analysis of their government policies
- Almost half of all respondents indicated they use the technology to communicate policy information to stakeholders
- 42 per cent use the technology to undertake impact assessment for proposed projects

# AN INCLUSIVE LOCAL GOVERNMENT PLATFORM

## Penang Geographic Information System Centre (PEGIS)

**To enable Penang's local government and socio-civic groups to effectively collaborate when drafting policies and determining resource allocation, PEGIS created a dynamic data-sharing platform called 'e-Peta'.**

e-Peta uses GIS technology to integrate and analyse authoritative data from multiple government departments and visually represent the insights on a smart map. It enables all stakeholders to access the same, accurate view of information and effectively collaborate when making decisions.

The award-winning application supports the projects and day-to-day operations of agencies – such as the PLANMalaysia@Penang, City Council of Penang Island (MBPP*) and Seberang Perai Municipal Council (MBSP**) — and has helped advance the advocacies of various non-profit organisations, including George Town World Heritage Incorporated (GTWHI), the Penang Botanic Gardens, and Penang Women's Development Corporation (PWDC), among others.

Additionally, e-Peta helps decision-makers at alms collection organisation, Pusat Urus Zakat, to locate Muslim households and analyse their corresponding demographic data to determine their needs and identify who should give and receive alms.

> "e-Peta has played a critical role in helping us create smarter ways to address issues and challenges in the community."
>
> **Abdul Azhar Bin Ibrahim,**
> Assistant Secretary, Penang Geographic Information System Centre

**Majlis Bandaraya Pulau Pinang (MBPP)*
***Majlis Perbandaran Seberang Perai (MPSP)*

# PRESERVING THE HERITAGE STATUS OF AN ICONIC MALAYSIAN HUB

## George Town World Heritage Incorporated

**George Town World Heritage Incorporated (GTWHI) has developed an inspiring GIS solution aimed at preserving Penang's rich colonial heritage and globally recognised architecture.**

Named the Integrated Heritage Database System, this system enables policymakers to monitor and enhance conservation efforts, and standardise guidelines for developers and property owners seeking to develop commercial spaces near heritage sites.

The technology creates a virtual map-based inventory of Penang's heritage sites, sourced from local municipal agencies' data, which enables local authorities to better manage and promote traditional festivals and other city events to tourists and the public.

GTWHI research officer Muhammad Hijas Sahari said prior to the map's implementation, they were concerned by several commercial developments underway surrounding George Town which did not have the legal approval from local authorities.

"Previously, the majority of information on heritage sites, conservation activities and commercial developments was only accessible in the field via spreadsheets and paper-based maps," Mr Sahari said.

"Now, using mobile devices, staff can access and record data on the ground and share this information in real-time with colleagues stationed in the office."

Since leveraging GIS technology, GTWHI and its partner agencies have already experienced an improvement in their monitoring activities – and local authorities can now provide standardised guidelines to property owners or investors seeking to develop commercial spaces near heritage sites.

> **"Now, using mobile devices, staff can access and record data on the ground and share this information in real-time with colleagues stationed in the office."**
>
> **Muhammad Hijas Sahari,**
> GTWHI research officer Muhammad Hijas Sahari

# A NEW ERA OF EFFICIENCY IN PUBLIC HOUSING POLICY

## Housing and Development Board, Singapore

When it comes to making policies around the design and development of Singapore's housing estates, the Housing and Development Board (HDB) makes evidence-based decisions using their iPLAN (Integrated Planning & Analysis) platform.

The GIS application allows users to map and explore different layers of geospatial data to analyse existing and proposed town developments and facilities within a certain area. The tool provides HDB's planners and architects with intuitive and effective access to up-to-date information, without the need to search through different data sources.

Prior to the implementation of iPLAN, the planning inputs used to be gathered through email consultations and past records before they were translated into plans for visualisation and analysis. Now data is captured within a single system and planners can retrieve development inputs instantly – translating to time savings and efficiency gains.

HDB has been capturing spatial data and integrating it into applications since the early 1990s – and moving forward, the Board plans to further develop the features within iPLAN to enhance town planning capabilities, to better anticipate and respond to future needs of the community when developing policy.

> **We will continue to improve our planning capabilities, and tap on innovative technologies to create more well-designed, sustainable and community-centric towns for our residents.**
>
> **Dr Cheong Koon Hean,**
> Chief Executive Officer, Housing & Development Board

# FUTURE OF GIS

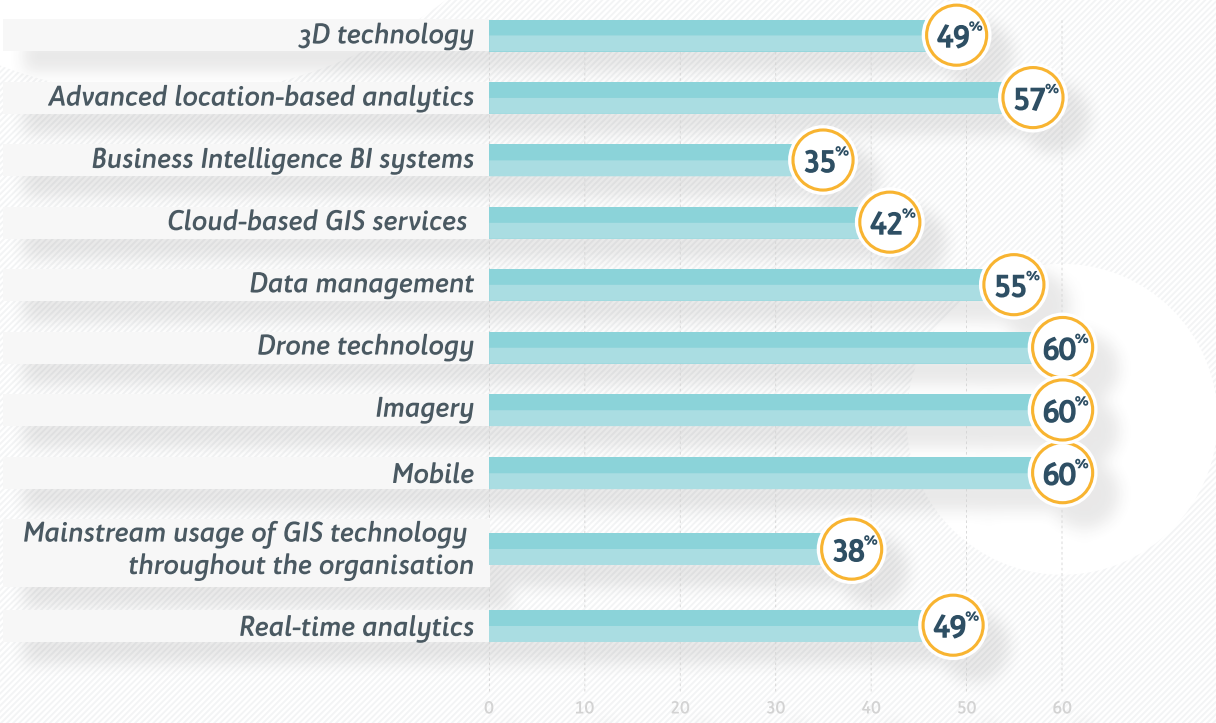
**RESEARCH INSIGHT:**

60 per cent of respondents indicated mobile, imagery and drone technologies would be the highest priorities for local government.

# Future of GIS

Question #23

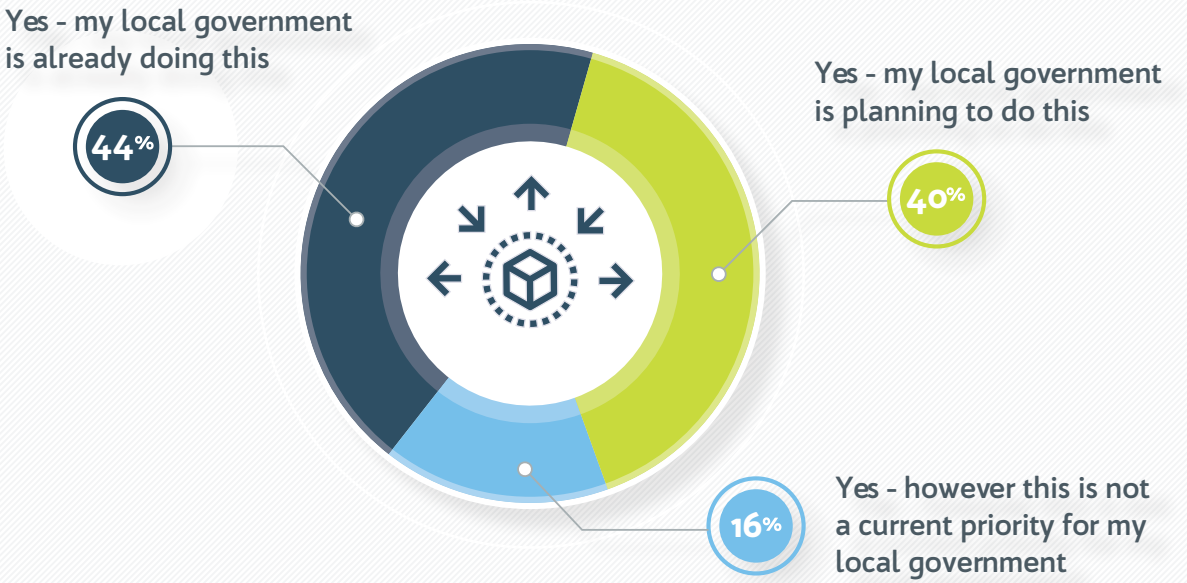
## OVER THE NEXT FIVE YEARS, WHICH GIS CAPABILITIES WILL BECOME A PRIORITY FOR LOCAL GOVERNMENT?




60 per cent of respondents indicated imagery, mobile and drone technologies would be the highest priorities for local government, followed by advanced spatial analytics (57 per cent) and data management (55 per cent).

Question #24

# DOES GIS HAVE A ROLE IN HELPING LOCAL GOVERNMENTS SHARE INFORMATION AND COLLABORATE WITH OTHER GOVERNMENT DEPARTMENTS?




**100%**
Believe GIS helps departments collaborate and share information

All respondents indicated GIS has a role in helping local government collaborate with other government-based stakeholders, with 44 per cent indicating it's something they already do and 40 per cent indicating they are planning on using GIS technology in this way.

Question #25

# IS YOUR AGENCY INVOLVED WITH THE MACGDI SPATIAL DATA INFRASTRUCTURE PROGRAM?


65 per cent of local governments surveyed indicated they are already involved with the Geospatial Data Infrastructure Program (MyGDI) developed by MaCGDI.

Question #26

# HOW IMPORTANT IS GIS TECHNOLOGY TO THE FUTURE OF THE NATIONAL SPATIAL DATA INFRASTRUCTURE?


Most respondents deemed GIS as an essential technology to the future of the National Spatial Data Infrastructure.

# OPENING ACCESS TO GEOGRAPHIC DATA

## Towards a spatially-enabled Malaysian government

**The Malaysian government views geospatial information as an essential national resource that should underpin all economic, social and environmental initiatives.**

In light of this, the Malaysia Centre for Geospatial Data Infrastructure (MaCGDI), under the Ministry of Natural Resources and Environment (NRE), is leading public sector geospatial information sharing towards a spatially enabled government and society.

Through the Malaysia Geospatial Data Infrastructure (MyGDI) program, MaCGDI has developed the Malaysia Geospatial Online Services (MyGOS) platform for sharing geospatial information through an online, accurate, cost effective and secure environment.

The initial objective of MyGOS was to support government agencies that do not have GIS infrastructure, by providing them with free access to geospatial information and capabilities. MyGOS makes this possible, enabling data to be shared through web services and applications within agencies.

Many of Malaysia's government agencies now collaborate with MaCGDI to use the MyGOS platform to support their planning, monitoring and decision-making.

For example, the Public Works Department (JKR) have used MyGOS to create an application called Aplikasi Sistem pemantauan Potholes (ASaPP) – which is used to monitor potholes and efficiently facilitate the required road repair and maintenance.

Looking to the future, MaCGDI intend to continue investing in the ongoing development of MyGOS, particularly in terms of improving the user experience. This will help ensure MyGOS retains its crucial role in supporting Malaysia to become a more advanced, resilient and sustainable country.

### MyGOS has become a decision-making tool for agencies including:

- Ministry of Higher Education (KPT)
  *Kementerian Pendidikan Tinggi*
- Ministry of Rural and Regional Development (KKLW)
  *Kementerian Kemajuan Luar Bandar dan Wilayah*
- Ministry of Works (KKR)
  *Kementerian Kerja Raya*
- Ministry of Energy, Green Technology and Water (KETTHA)
  *Kementerian Tenaga, Teknologi Hijau dan Air*
- Civil Defence (APM)
  *Angkatan Pertahanan Awam Malaysia*
- Malaysian Maritime Enforcement Agency (APMM)
  *Agensi Penguatkuasaan Maritim Malaysia*
- Implementation Coordination Unit, Prime Minister's Department (ICU, JPM)
  *Unit Penyelarasan Pelaksanaan, Jabatan Perdana Menteri*
- Melaka Zakat Centre (PZM)
  *Pusat Zakat Melaka*
- National Hydrographic Centre (HYDRO)
  *Pusat Hidrografi Nasional*
- Malaysian Rubber Board (MRB)
- Halal Industry Development Corporation (HDC)
- Department of Veterinary Services (JPV)
  *Jabatan Perkhidmatan Veterinar*

# CONNECTING THE COUNTRY

## Indonesia's national spatial data infrastructure

**To realise its growth potential, the Indonesian government identified the need for a national spatial data infrastructure (NSDI) that would enable government, citizens and businesses to easily share information and collaborate on projects.**

The Geospatial Information Act was established to help achieve this goal in two main ways. Firstly, to ensure authoritative geospatial information was made available and could be easily accessed, and secondly to facilitate an environment of co-operation, coordination, integration and synchronisation between government and community stakeholders.

Badan Informasi Geospasial (BIG) – the non-ministerial government agency tasked with organising geospatial information programs – first began to build and develop infrastructure and systems to connect the country's distributed network nodes and build the NSDI in 2011.

Known as 'Ina-Geoportal', the NSDI platform is the only national portal that connects to the network node of government Ministries and Agencies, Armed Forces, Police and Local Government to enable data sharing.

Since the completion of the NSDI project in May 2015, the platform has connected to more than 70 network nodes (equivalent to 11 per cent of the target) and has thousands of users from various industries and communities.

It has also undergone several updates over the past couple of years, including improving the user interface and user experience, delivering a responsive new design for use across multiple devices, introducing bilingual content and creating a data download feature.

Looking to the future, BIG will continue to work on NSDI, with a focus on accelerating the network node development. They will also focus on creating a disaster recovery centre, so if an issue causes the system to experience an outage, the Ina-Geoportal can still be accessed by the public.

# A TRUSTED NATIONAL RESOURCE

## United States' national spatial data infrastructure

**A best-practice example of spatial data infrastructure is the United States' GeoPlatform, which enables seamless geospatial resource sharing across the United States government.**

GeoPlatform was developed by the member agencies of the Federal Geographic Data Committee (FGDC) and serves as a strategic national resource that supports open government, open data and digital government strategies to enhance transparency, collaboration and participation.

For example, when Hurricane Harvey struck the United States in 2017, the GeoPlatform made it possible to quickly develop and share maps containing critical emergency data from multiple agencies and stakeholder groups, to support response and recovery efforts during and following the crisis.

The portfolio of data, applications, and services provided on the GeoPlatform is stewarded with open licenses and hosted on cloud infrastructure that maximises geospatial interoperability.

## SEE THE GEOPLATFORM APP IN ACTION

Click to explore GeoPlatform's shared and trusted geospatial data, services, and applications, which are helping the United States' government agencies and partners to meet their mission needs.


### Data services:

The GeoPlatform delivers trusted, nationally consistent, authoritative geographically enriched social, economic, environmental and other data for understanding and decision-making.

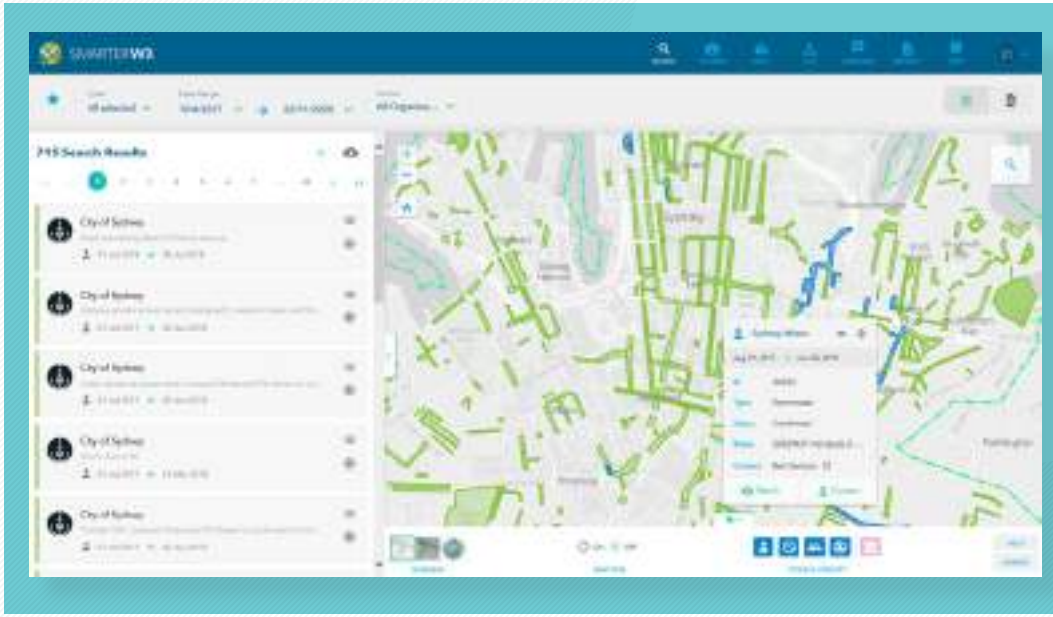
### Applications and tools:

The GeoPlatform provides a suite of applications and tools for integrating, synthesising, analysing, problem-solving and visualising geographically enriched data to accelerate understanding and decision-making.

### Shared services:

The GeoPlatform provides shared hosting infrastructure that allows agencies to publish their geospatial data, applications, and tools in a secure cloud-computing environment at a low cost.

# SINGLE GIS PLATFORM UNIFYING 50 LOCAL GOVERNMENT AUTHORITIES



## Australia iWORCS platform

More than 50 Australian local government authorities, utilities and other government agencies are coordinating their capital works and infrastructure projects and saving money by sharing road maintenance costs, by using a collaborative Cloud-based GIS platform.

The platform – known as iWORCS – delivers significant efficiency benefits, such as ensuring roads are only dug up once to undertake maintenance and repairs.

Participating organisations simply upload their work schedules and relevant data into iWORCS to create a central record of planned works that all stakeholders can access before undertaking road work.

Opportunities to align schedules are clearly highlighted on an interactive map, which delivers not only cost savings but also improved community safety through reduced traffic disruptions and damage to road and footpath surfaces.

Stuart McDonald, Wastewater and Stormwater Team Leader at Sydney Water, a participating agency, indicated his organisation could save AU$1 million in the first couple of years from using the platform.

"Too often when utilities and councils work independently, projects aren't aligned, causing re-work, customer frustration and waste. We can see the opportunity to minimise interruptions to our customers, reduce waste and duplication, while ensuring Sydney's assets – including council's re-sheeted roads – last for the longer-term," Mr McDonald said.

> "It's an excellent example of government agencies and councils working together in a way that's of real benefit to residents and businesses alike."
>
> Lord Mayor Clover Moore, City of Sydney

SPECIAL NOTE

*Thank you to all who participated in the survey and for those who freely gave us permission to reference their comments throughout this report.*

# LEARN MORE

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