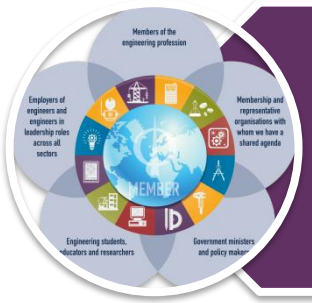
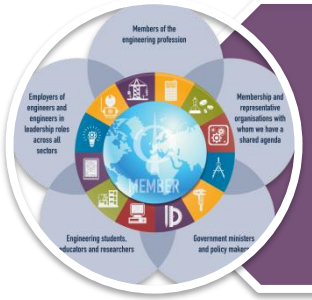
Engineers Ireland

The State of Ireland 2018

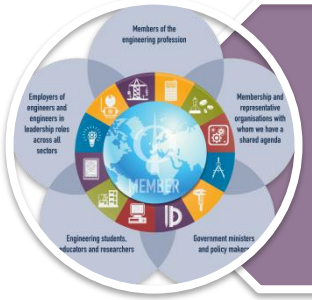
A review of infrastructure in Ireland



Engineers Ireland is the voice of the engineering profession in Ireland.



Representing the engineering profession since 1835, one of the oldest and largest professional bodies in Ireland.



Over 25,000 members across every discipline of engineering, from engineering students to fellows of the profession.

Our vision

A community of creative professionals delivering solutions for society

A ‘Perfect Storm’

- Infrastructure is vital to enabling sustainability, health and wellbeing, and long-term prosperity

- Yet we face a ‘perfect storm’ of pressures on our infrastructure
  - **Demographics**: population is expected to increase by over one million in the next 20 years
  - **Climate action**: greenhouse gas emissions are behind targets
  - **Competitiveness**: congestion and future lack of capacity will hamper growth and employment in the coming years without swift action

Sustainable planning

- Infrastructure is part of an interconnected **system** or a ‘system of systems’

- With **housing supply** increasing, attention must be paid to, e.g.:
  - Transport connectivity
  - Broadband and mobile coverage
  - Energy efficiency and renewables
  - Water and wastewater capacity
  - Flooding risk
  - Building quality and control

Project Ireland 2040
National Planning Framework

- Planning must be holistic, evidence-based and long-term

- The alignment of spatial planning and investment is critical

- We advised the development of the **National Planning Framework**

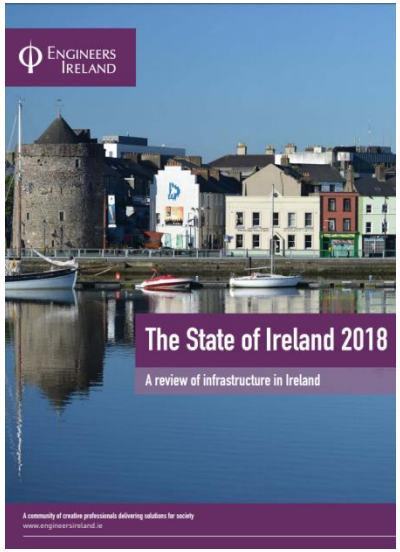
Investing confidence

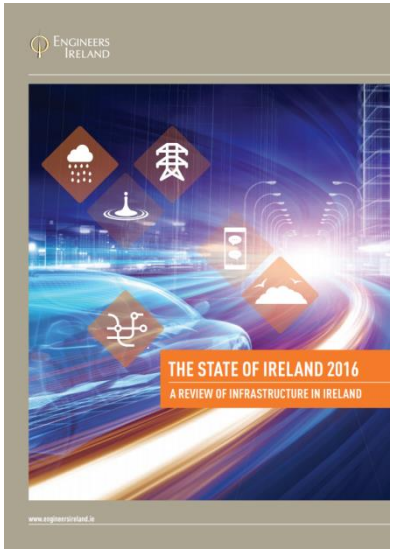
- Engineers Ireland welcomes the **National Development Plan 2017-2027**
- This provides a 10-year pipeline of projects and should encourage **confidence**
- A step-by-step **implementation** plan would assi
- Some key projects are:
  - National Broadband Plan
  - Metro Link, DART expansion and BusConnects
  - M20 Cork to Limerick
  - Airports and ports
  - Renewables and grid interconnection
  - Retrofitting for energy efficiency
  - Water and wastewater networks

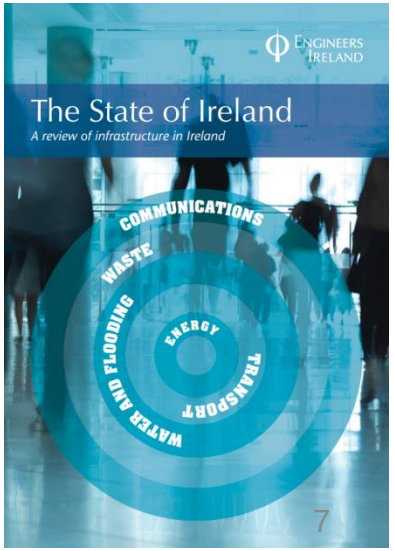
Project Ireland 2040
National Development Plan 2018—2027

today

The State of Ireland







The State of Ireland

Engineers Ireland

Water / Wastewater

Transport

Energy

Flooding

Communications

Waste

2018

Advisory group

Arup	JBA Consulting Engineers
DCCAE	McAdam Design
Department for Infrastructure NI	Met Éireann
DHPLG	Mott MacDonald
Dublin City Council	NFGWS
Energy & Environment Division	NI Water
EPA	Nicholas O'Dwyer Ltd
Geotechnical Society of Ireland	NUI Galway
Glan Agua	OPW
GSI	Roads & Transportation Society
HSE	Roughan O'Donovan
Inland Fisheries Board	RPS
Irish Academy of Engineering	Transport Infrastructure Ireland
Irish Water	UCD
Jacobs	Veolia

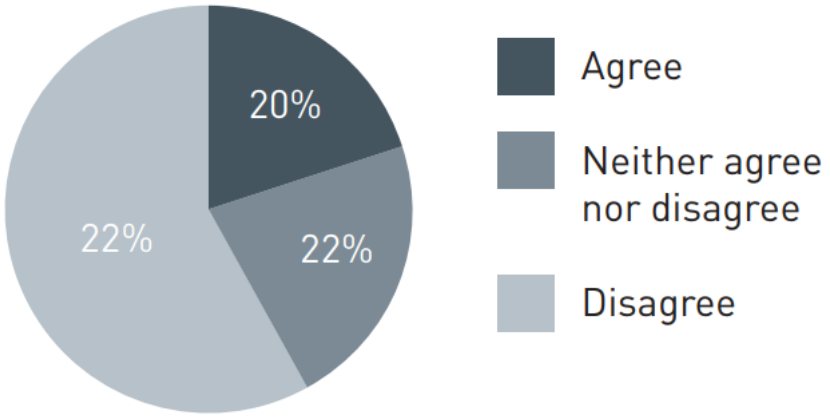
Grading scheme

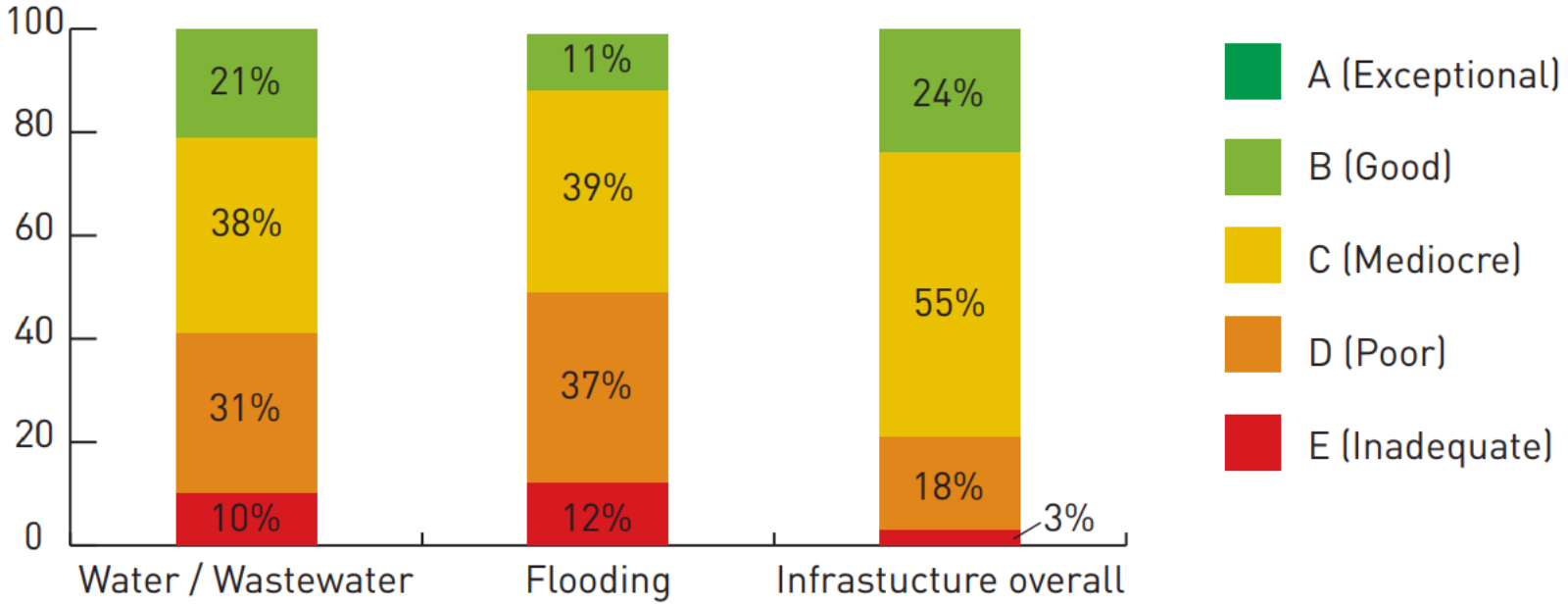
A Exceptional	Well maintained, in good condition, appropriate capacity and planning for future development;
B Good	Acceptable standard, properly maintained, able to meet demand, though investment needed in the next five years;
C Mediocre	Inadequately maintained, and / or unable to meet peak demand, and requiring significant investment;
D Poor	Below standard, poorly maintained, frequent inability to meet capacity and requiring immediate investment to avoid adverse impact on the national economy;
E Inadequate	Unacceptable condition, insufficient capacity, and already impacting on the national economy.

Member survey

Ireland's infrastructure is in good condition with capacity for future development

n = 1,000 Chartered Engineers





Water / wastewater

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- Water resources
- Public water supply
- Public wastewater
- Private water supply and wastewater

Water resources

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D Source protection

C Source availability

C Abstraction

Two-year recommended actions

- Improve the protection of human and environmental health by providing groundwater and surface water Source Protection Plans for all viable supplies and upgrade well heads and abstraction points where deficiencies are immediately apparent.
- Expand research and application of sustainable water resource managem

Five-year recommended actions

- Fully assess the environmental sustainability of existing abstractions in the context of likely future water demand and adopt a sustainable approach to water abstraction by, for example, amalgamating inefficient water supply schemes into more appropriately located and efficient schemes.
- Implement effective land use management plans within catchment areas to mitigate the risks of contamination occurring, which should dovetail and be in conjunction with the work to achieve WFD compliance.

Public water supply

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Large-scale treatment | **Small-scale treatment** | **Distribution network**

Two-year recommended actions

- Undertake Drinking Water Safety Plan risk assessments and implement mitigation measures to address all high and very high risk hazardous events identified in Drinking Water Safety Plans to protect public health.
- Reduce unaccounted-for water to 40% (saving the equivalent of 10,000 Olympic-sized swimming pools of water per year) by scaling up investment in active leakage control, supported by water mains rehabilitation and replacement.

Five-year recommended actions

- Achieve significant milestones in working towards a safe and secure drinking water supply for the entire country through the implementation of mitigation measures identified in Source Protection and Drinking Water Safety Plans.
- Start construction on the Eastern & Midlands Water Supply Project
- Reduce unaccounted-for water to 35% (saving the equivalent of 12,000 Olympic-sized swimming pools of water per year)

Public wastewater

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C Collection

C Large-scale treatment

E Small-scale treatment

D Sludge management and treatment

Two-year recommended actions

- Target investment at the elimination of all untreated wastewater discharges and achieving compliance with the Urban Wastewater Treatment Directive.
- Upgrade existing key strategic infrastructure such as water supply at Vartry, water treatment at Cork Lee Road and wastewater treatment at Ringsend and Cork Lower Harbour.

Five-year recommended actions

- Achieve and maintain compliance with the Urban Wastewater Treatment Directive and Drinking Water Directive.
- Start construction on the Greater Dublin Drainage Project

Private water and wastewater

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Private GWSs

Private wells

Domestic wastewater

Two-year recommended actions

- Launch a Sustainability Education Programme on the water cycle, water quality and the value of water, targeting in particular domestic water and wastewater systems.
- Carry out the identified upgrades on private GWS treatment facilitates listed on the GWS Remedial Action List
- Complete extensive review of the GWS sector to devise a rationalisation and amalgamation programme to form more sustainable water supplies.
- Review the operation of new and existing domestic water supplies and wastewater treatment.
- Incentivise a major expansion of desludging of domestic wastewater treatment systems and plan for the management of sludge generated.

Five-year recommended actions

- Develop and implement Source Protection Plans for all GWS private supplies
- Implement a rationalisation and amalgamation programme for the GWS sector focusing on small private supplies with less than 100 domestic connections
- Implement the recommendations of the review of domestic water supplies and wastewater treatment with a view to transferring knowledge, ownership and accountability of clean water supplies and non-polluting wastewater treatment systems on the domestic user.

Flooding (overview)

- Coastal
- River
- Urban
- Rural
- Groundwater
- Forecasting and warning

Implementing the Flood Plans

Two-year recommended actions

- Develop a strategic plan for the efficient delivery of schemes identified in Flood Risk Management Plans (Flood Plans) and smaller schemes, drawing on international best practice and including the following key components:
  - Multi-annual budgeting for the implementation of Flood Plans and a programme of proactive maintenance of existing structures and associated waterways;
  - A multi-stakeholder taskforce to review the operation of legislation and policy governing flood risk management;
  - Standard methodologies for the translation of current knowledge on climate change into design guidance for resilient infrastructure;
  - A public engagement campaign on flooding causes and the full array of hard and soft risk management options, including nature-based water retention options and managed retreat. Showcase the functioning of completed flood risk projects.

Implementing the Flood Plans

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Five-year recommended actions

- Act on the outcomes of the proposed review of legislation and policy governing flood risk management. Consider whether a dedicated authority with statutory powers be established to manage flood risk, pollution and land management at a catchment scale.

- Undertake research and establish appropriate design standards for flooding infrastructure with multiple benefits, e.g. integrating with water quality and environment-supporting conditions.

- Roll out the strategic programme of Flood Plan projects in a phased and coordinated way that will encourage the organisations involved to upscale their capacity to construct and deliver these projects.

- Develop a national database of flood risk management facilities to enable the protection of critical infrastructure, e.g. hospitals, power stations and wastewater treatment plants.

Flood forecasting & warning

Two-year recommended actions

- Expedite the development of flood forecasting capability for larger catchments and more populated bays around Ireland. Pilot linkages of forecasts and warnings.
- Maintain and extend the network of permanent measurement facilities (e.g. CGPS, rain gauges, rainfall radar, water level monitoring, satellite / remote measurement).

Five-year recommended actions

- Continue the development of the national flood forecasting service and improve local warning systems to assist emergency response.
- Enhance permanent measurement and monitoring facilities as well as comprehensive data systems and analysis to reduce uncertainties in quantifying flood risks.

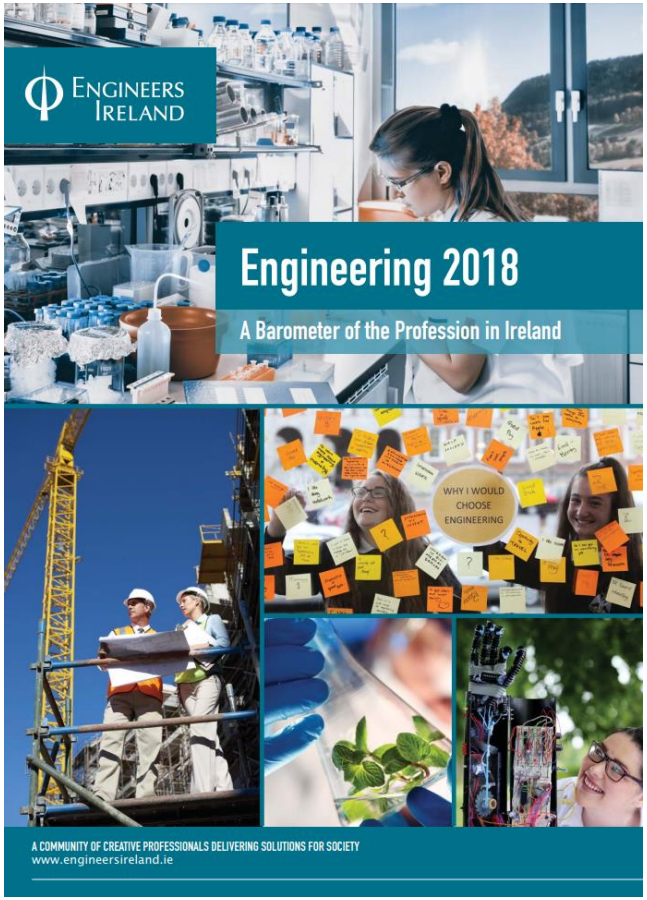
Engineering skills

- To deliver these and other infrastructure projects, a skilled and diverse **labour force of engineers** is crucial

- The current **shortage** of engineering graduates is seriously threatening our infrastructure plans in housing, transport and elsewhere

- Engineers Ireland is actively involved in promoting Science, Technology, Engineering and Maths (**STEM**) subjects in primary and secondary schools

- We want to encourage more young people, **especially young women**, to study STEM – and engineering in particular

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