

Infrastructure

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Will we recognise London in 2062? Yes, but it will be different in many ways. Since 2018–2020, infrastructure has been designed using holistic engineering principles, and the synergies of co-routing, construction, operation and maintenance are delivering strong benefits of cost and functionality. Waste, water and energy links run in segregated subsurface trunking (operated as a commercial value aggregation service), with built-in condition monitoring to give early warning of leaks or other failures. The system water shortage in the South East was alleviated with the national water grid (still in development), part of which uses the old canal system, which with the addition of pumping stations, proved a surprisingly low-cost solution. London still has one of the best public transport systems in the world, with autonomous guided P2P above ground and an upgraded Underground, with long, fast trains and climate control. Heat extracted from Underground tunnels is sold to business consumers.

Energy

The Climate Change Act ultimately led to mass adoption of zero-carbon electricity generation and an almost complete move to electrification of the UK's domestic, industrial and transport energy consumption. The country now has a fleet of 30 nuclear power plants, which increased by 10 in the 2030s, after off-shore wind was found to be expensive and unreliable. Local renewable generation is widespread, with over half of homes having either solar-thermal or PV panels, together representing some 30GW. Significant investment in energy storage systems has mitigated the intermittency of renewables. Electricity supply companies, following the 'smart electricity' initiative with dynamic tariff and appliance control functionality, have flexible control of local generation as well as consumer loads. Grid networks were reinforced in the 2020s, with coastal high-voltage DC links routed the length of the country through the North Sea, and with further links to Scandinavia and the Continent. Supergrid pylons are now an unusual sight.

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Transport

All private cars are electric (see electric cars), and the development of high-density flow batteries means that fuelling can be done by buying liquid electrolyte at roadside stations or by charging at home. Range is no longer a problem, with a full tank typically offering 1000km or more. Ownership is by leasing, as it is not cost-effective to buy a car, following introduction of the 40% Consumption Tax, which encourages servitisation of capital consumable products. Most families have their own cars, but these are not used in London where Point2Point provides affordable, profiled point to point transport, with subscriber journey aggregation.

Intercity transport is exclusively by the electric HSNNet, routinely operating at 350km/hr, with most main cities connected. Cross-city and high-speed links opened up commuting possibilities, making Oxford only 30 minutes from the city.

Air travel is still widely used for international journeys, as biosynthetic avgas is now readily available and affordable. Marine transport is increasing using automated sail technology, especially for freight; this has been driven by carbon emission controls and fuel costs.

Housing and buildings

In London, housing styles changed radically in some areas and less so in others. Deep retrofit was applied to all old stock by 2050, and now just 50% of the properties extant in the early 2000s are still in use, but with radically reduced energy consumption. Retrofit proved very difficult, and the UK did not meet its targets until 2055. In many cases, multiple phases of renovation were needed. The non-heritage scrappage scheme enabled replacement of buildings beyond economic renovation, and has allowed the City to be remodelled into a high-density, mixed-use environment. Building Information Modelling (BIM) is now ubiquitous for capital construction in the public and private sectors, applying from design visualisation and co-creation with clients through computer-aided off-site manufacture, to real-time performance optimisation.

Food and retail

Supermarkets still exist, but they sell only food. The processed elements of much of this are manufactured on-site in hyper-automated factory modules. Consumer retail is almost exclusively via the web, although high-value clothing is customised, with measurements taken and delivered on-line via high street stores. Where shops exist, they are essentially showrooms for web goods. The high street is now mainly a meeting place with a large variety of eating places and personal service providers.

What used to be capital consumer purchases are now provided as services, with the provider owning the asset and maintaining it to the latest and best standards. 40% VAT on capital consumer purchases has essentially enforced leasing as a model for such commodities.

Health, wellbeing and aging

By 2020, the National Health Service was faltering and private wellness insurance and the stabilised aging demography were driving personal behaviour. Home monitoring, assisted living and affordable personalised medicine are now everyday facts of life. Telehealth and telecare are offered by real-time service providers on a subscription basis; some of these providers are subsidiaries of health insurers. Other real-time services are often 'bundled' with this – security and home energy control being typical. Personalised medicine means that most tissues can be replaced with cul-

tured stem-cell derived material, harvested from the individual earlier in their lives. Options are provided in wellness insurance for ceasing interventions at a certain age, this has led to extended quality life followed by very rapid decline, and this is frequently planned and managed. It is usual for people to die (see death) in their own homes, so public care homes are the exception rather than the rule. Home automation is as commonplace as entertainment systems; frequently this includes mobile house avatars, providing assistance and companionship.

Security

Identity theft and financial fraud had been growing problems until the introduction of DNA validation. This is now used in most major transactions. The elimination of cash also reduced street crime. Cybersecurity continues to be a major concern, but netbot policing has reduced this to manageable levels. However, increased teleworking has given rise to the ‘cyber-employee’ problem, where staff members defraud employers by using computers to simulate work attendance, giving new relevance to the ‘Turing Test’.

Education

Teacherless schools were introduced in the 2050s. Schooling now takes place through distance learning and tele-tutorials, with physical attendance supervised by para-tutorial staff who focus on sport and social skills.

Universities have long since clustered into virtual Centres of Excellence, and close partnerships with business have meant that learning experiences are closely tailored to the needs of individuals and future employers. A permeable approach to further and higher education has encouraged apprenticeships and made transfer to degree courses readily available for students of all ages. More than half of undergraduate courses are now delivered at large scale by distance learning, following the adoption of Massively Open Online Courses in 2012–2020. Virtual tutors allow one-to-one and group support using AI technologies.

Information

Ubiquitous ICT led to most people suffering information overload by 2020. Smart Personal Algorithmic Logic now contextualises and bundles information so individuals only see what is relevant to their location and current activities. High-speed wireless communication in urban areas has enabled all but the most elementary everyday device to have its own web identity, to report its location, state of health and current usage status. The world has become ‘object-orientated’ with physical items holding and communicating design, maintenance and status information – an essential requirement of the servitised economy.

Economy

Growth is small but positive following negative population growth and the radical policy overhauls which were dictated by the failure of classical economics in the ‘20s. Most employment is in the service sectors, with hospitality, entertainment and maintenance strong. Manufacturing is now re-localised and hyper-automated, yielding strong industrial profitability; this has strengthened tax revenues enabling adequate welfare benefits, although most public sector activity is executed through GovNet, and the civil service is 10% of its size at the beginning of the 21st century.

