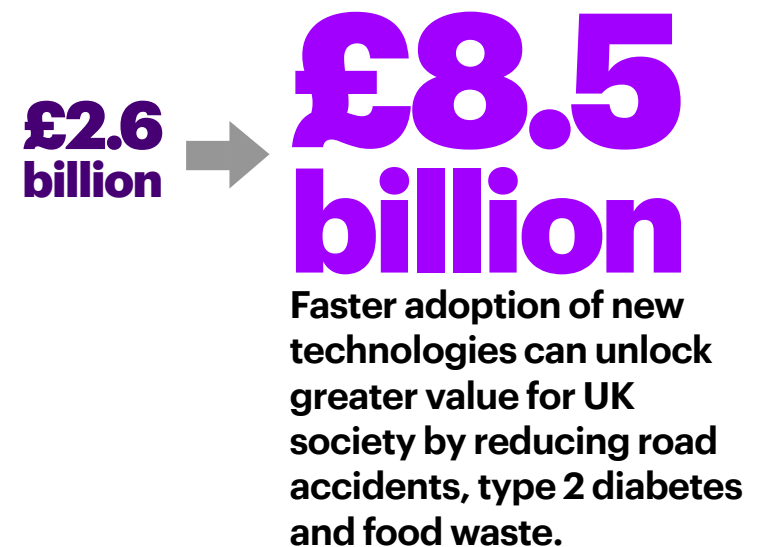# INCLUSIVE
TECHNOLOGY

**Tackling the UK's societal challenges better and faster
with new technology**

By Matthew Robinson and Amalie Kjaergaard

The spread of artificial intelligence (AI) and other new technologies is improving the UK's ability to tackle costly societal problems. We estimate that, by 2025, technology-driven progress in just three areas—road accidents, type 2 diabetes and food waste—will unlock £2.6 billion worth of value for UK society. If, however, such technology were to be more widely adopted, the payoff would be greater still—up to £8.5 billion, according to our estimates.

There is no simple guide for scaling complex technologies efficiently and inclusively. But an ecosystem approach that fosters collaboration between diverse public and private stakeholders will help lay a foundation for sustained success.

£2.6 billion → **£8.5 billion**

Faster adoption of new technologies can unlock greater value for UK society by reducing road accidents, type 2 diabetes and food waste.

The £8.5 billion reward

—

AI and other new technologies will gradually transform many areas of the UK economy, not least the transport, food and healthcare sectors. But to what extent can such technologies be scaled to deliver major benefits sooner rather than later?

The UK government's Grand Challenges initiative urges technologists to work with policy makers to address important societal challenges.[i] These include preparing for the consequences of a fast-ageing population, encouraging cleaner economic growth and transforming how people get around.

Accenture investigated the implications of making significant progress on three challenges that collectively impose costs on UK society of £65 billion per year: road accidents, type 2 diabetes and food waste (Figure 1). To do this, we partnered with Frontier Economics, a microeconomics consultancy, to model the impact, from 2018 to 2025, of three new technology applications with demonstrated track records:

- automated braking and collision-warning systems for cars;

- lifestyle-support apps for type 2 diabetes patients; and

- "smart" food-management technologies for homes and restaurants.

Figure 1: A £65 billion challenge

Accenture investigated the implications of making significant progress on three challenges that collectively impose costs on UK society of £65 billion per year: road accidents, type 2 diabetes and food waste.

Road Accidents
# £36bn

Total road accident costs[ii]

- 2.5m accidents annually[iii]

- 160,597 casualties each year[iv]

- 27,295 (17%) casualties are serious or fatal

Type 2 Diabetes
£10bn

Total annual diabetes care cost to the NHS[v]

- 4.7m people in the UK live with diabetes: or 1 in 15

- 10% of the NHS budget is spent on diabetes care

- Every year, diabetes causes more than 27,000 heart attacks and almost 100,000 cases of heart failure
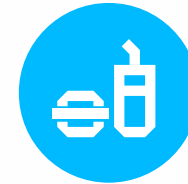
Food Waste
£19bn

Total cost of post farm-gate food waste[vi]

- 9.5 million tonnes food wasted annually in the UK[vii]

- 70% of waste occurs in the home

- £720 wasted per household annually

The Total Value Canvas

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Our "Total Value Canvas" model incorporated diverse stakeholders, unlike most standard business models; it took account of costs and benefits that traditional economic measurements— such as GDP—often overlook; and it used publicly available data on the rate of technology adoption, costs and benefits (see box, "Shaping inclusive technology with the Total Value Canvas").

Our initial, status quo analysis estimated that our chosen three technologies will unlock £2.6 billion of trapped value for UK society by 2025. Such gains translate into 46,000 fewer annual road accidents, 9,000 more type 2 diabetes patients entering remission each year and 362,000 fewer tonnes of food wasted annually.

There are, however, reasons to think that these estimates, while robust, are too conservative. They assumed that automated braking systems will continue to be present in just 30 percent of new cars, despite their widely acknowledged effectiveness; that only 0.2 percent of people with Type 2 diabetes will use a lifestyle-support app, despite the fact that 26 percent of users of one such app (Oviva) saw their diabetes enter remission;[viii] and that only 13 percent of refrigerators will have smart capabilities, as they do now, even as consumers increasingly clamour for them.

If, instead, the UK were to adopt these technologies at a faster pace, what would be the gains to society, as well as to business?

In our "high adoption" scenario, we assumed that, by 2025, all new cars will have automated braking systems, 30 percent of type 2 diabetes patients will use a lifestyle-support app, and 70 percent of households and restaurants will use food-management technologies.

The upshot: up to £8.5 billion of societal value unlocked in 2025 alone (Figure 2), or £5.9 billion more than under our conservative estimate.

A high adoption scenario would mean, each year, 76,000 fewer road accidents, 162,000 additional type 2 diabetes patients in remission and 704,000 fewer tonnes of food waste.

Figure 2: £8.5bn in annual value waiting to be unlocked

By accelerating adoption rates of technologies, more value can be unlocked by increasing benefits to society.

VALUE RELEASED IN 2025	Based on today's adoption	With accelerated adoption	
Road Accidents	**£1.3bn**	**100%** Cars have automated braking technology	Up to **£2.2bn**
Type 2 Diabetes	**£0.2bn**	**30%** Type 2 diabetes patients use a lifestyle support app	Up to **£4.2bn**
Food Waste	**£1.1bn**	**70%** Households and restaurants use food-management technologies	Up to **£2.1bn**

Figure 3: Our Total Value Canvas shows how the value unlocked by technology would be distributed to different stakeholders in 2025

13%
Businesses

87%
Road users and society

ROAD ACCIDENTS

12%
Patients

14%
Businesses

74%
Society

TYPE 2 DIABETES

4%
Society

22%
Businesses

74%
Households

FOOD WASTE
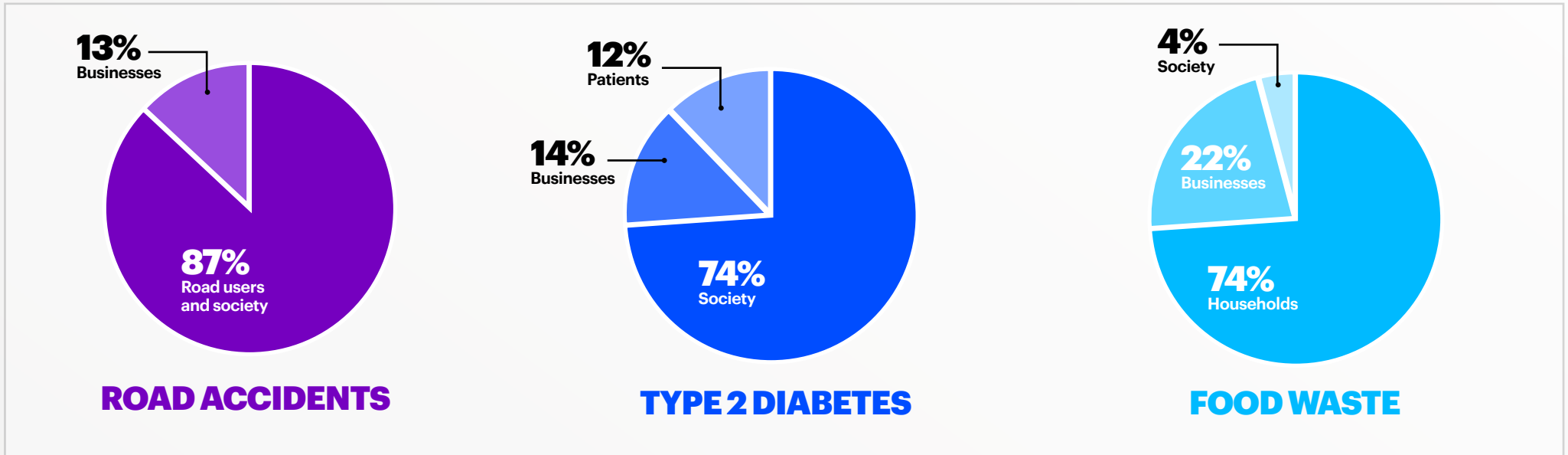
New technologies can create significant value for individuals and society. However, there are losers as well as winners within some stakeholder groups.

For example, fewer road accidents—in addition to their big social gains—may reduce demand for new cars, auto repairs and insurance services. Fewer diabetics may reduce demand for insulin. Less food waste may cut grocery shopping bills.

Companies that are negatively affected will have to adapt their business models. A big priority should be stimulating innovations that target, among others, the increased consumer spending power and additional leisure time available in a safer, healthier world.

Four steps to get started

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New technologies—some already in use, others on their way—are gradually being applied to help tackle some of the UK's toughest societal challenges. To scale these innovations and ensure that the gains they deliver are inclusively shared, organisations should embrace a collaborative ecosystem approach. Start with these four steps:

01

Clarify the organisation's goals and tactics.

Are stakeholders clear about the societal challenges that they seek to address? Do they deeply understand the dynamics driving those challenges? What new technologies might help solve them?

02

Curate the ecosystem.

What mix of participants from the public and private and social sectors is needed for well-designed interventions? What business models are needed to sustain such interventions? And when it comes to getting different stakeholders around the same table, who is best placed to make that happen?

03

Paint a Total Value Canvas.

Does the ecosystem have a shared understanding of how value will be created, or will migrate, under different rates of technology adoption? Do those shared scenarios adequately reflect the complexity of the societal challenges and proposed interventions?

04

Commit to responsible innovation.

Do stakeholders trust their mutual commitment to foster inclusive growth? Do they trust each other to help minimise the potential downsides of new technologies—such as algorithmic bias, job churn or loss of privacy?

Some additional questions for policy makers
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To encourage the development of ecosystems that allow stakeholders to create societal value, policy makers would do well to ask themselves the following:

1. What new technologies are available to address a given societal challenge—and at what cost?

2. Are we contributing constructively—and encouraging others to do the same—to dialogue related to this challenge?

3. How might private venture capital encourage the spread of new technologies—and can public funds be deployed to accelerate their spread?

4. Have we challenged the private sector to tackle the problem by setting measurable progress targets?

5. What incentives can we offer consumers and businesses to adopt new technologies?

Shaping inclusive technology with the Total Value Canvas

Accenture collaborated with Frontier Economics to develop the Total Value Canvas—a model that measures the value that could be realised from applying technology to a societal challenge. We selected the three challenges discussed above because of the huge costs that they impose on UK society and because there was adequate, publicly available, data on which to base our modelling. And we based our projections on an assumption of current rates of technology adoption, as well as on three faster rates of adoption (low, medium and high). Our complete projections are seen in the table below.
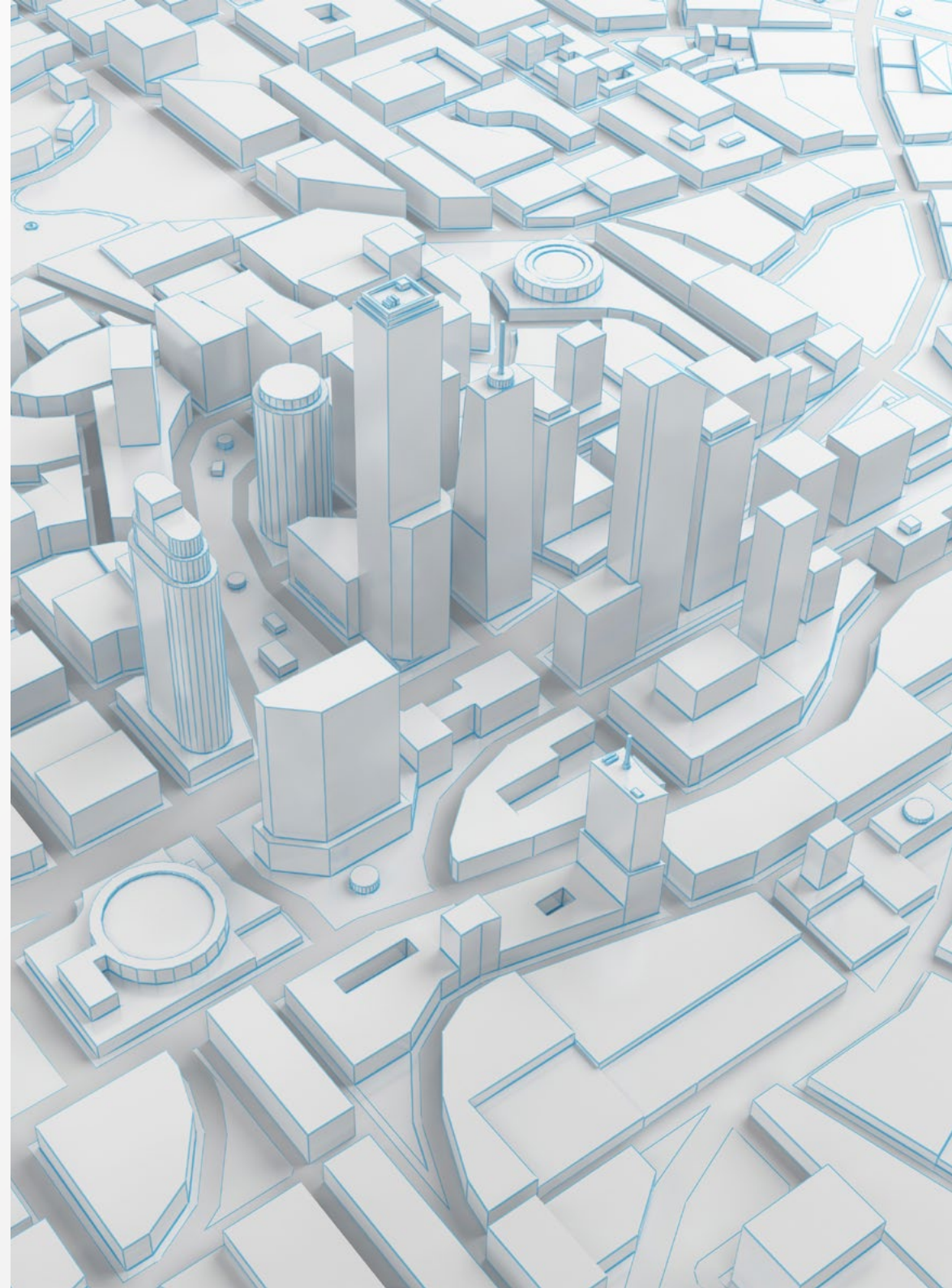
ROAD ACCIDENTS
Shaping inclusive technology with the Total Value Canvas

	Current trajectory	Adoption push: Low	Adoption push: Medium	Adoption push: High
Road accidents: implementation of in-vehicle autonomous emergency breaking and forward collision warning systems	in 30% of new cars in 2025	reaches 50% of new cars by 2025	reaches 75% of new cars by 2025	reaches 100% of new cars by 2025
Drivers and other road users: accidents prevented	£594m	£705m	£843m	£980m
Insurers & car manufacturers: reduction in premium and replacement/repair revenue	–£628m	–£744m	–£890m	–£1,036m
Technology innovators: sales revenue from autonomous emergency braking and forward collision warning systems	£39m	£46m	£55m	£64m
Other production industries: change in discretionary consumption, insurance costs, productivity, R&D applications	£766m	£908m	£1,086m	£1,264m
Insurers & car manufacturers: reduction in premium and replacement/repair revenue	£561m	£666m	£796m	£926m
Total value in 2025	**£1,333m**	**£1,580m**	**£1,889m**	**£2,199m**
Incremental value in 2025		**£247m**	**£556m**	**£865m**

CHRONIC DISEASE - TYPE 2 DIABETES
Shaping inclusive technology with the Total Value Canvas

	Current trajectory	Adoption push: Low	Adoption push: Medium	Adoption push: High
Chronic disease - type 2 diabetes: patient adoption of digital lifestyle aid	at scale of exsisting trials	reaches 10% of patients by 2025	reaches 20% of patients by 2025	reaches 30% of patients by 2025
Patients: increase in productivity and reduction in illness related costs	£26m	£169m	£325m	£488m
NHS: reduction in care costs	£23m	£148m	£284m	£426m
Technology innovators: sales revenue from digital lifestyle aids	£2m	£10m	£20m	£30m
Other UK industries: increase in productivity and R&D applications	£8m	£50m	£96m	£144m
Society: overall gains from improvements in quality of life	£167m	£1,084m	£2,082m	£3,123m
Total value in 2025	**£224m**	**£1,461m**	**£2,807m**	**£4,210m**
Incremental value in 2025		**£1,237m**	**£2,582m**	**£3,985m**

FOOD WASTE
Shaping inclusive technology with the Total Value Canvas

	Current trajectory	Adoption push: Low	Adoption push: Medium	Adoption push: High
Food waste: adoption of digital food tracking technologies in homes and restaurants	reaches 36% of UK households and restaurants by 2025	reaches 50% of UK households and restaurants by 2025	reaches 60% of UK households and restaurants by 2025	reaches 70% of UK households and restaurants by 2025
Households: reduction in wasteful food consumption; lower restaurant prices	£814m	£1,131m	£1,357m	£1,583m
Grocery retailers: reduction in wasteful food expenditure	–£334m	–£464m	–£557m	–£650m
Restaurants: reduction in wasteful food expenditure	£75m	£104m	£125m	£146m
Technology innovators: sales revenue from digital food tracking technology	£53m	£74m	£89m	£104m
Other UK industries: increase in discretionary non-food consumption R&D applications	£452m	£628m	£753m	£879m
Society: net environment benefit from waste reduction	£36m	£49m	£59m	£69m
Total value in 2025	**£1,096m**	**£1,522m**	**£1,826m**	**£2,130m**
Incremental value in 2025		**£426m**	**£730m**	**£1,035m**

About the research

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Accenture worked with Frontier Economics to develop a way of measuring the total value that could be realised by applying technology to well-defined societal challenges. We selected three topical UK societal challenges where a proven application of new technology has significant potential for additional positive impact.

For each societal challenge, we undertook the following steps:

1. We built an economic model of the existing relevant system from 2018 to 2025, defining relevant stakeholder groups and using welfare economics to put a monetary value on outcomes such as quality of life.

2. We created a base case by closely tracking how the technology application—on its current adoption trajectory—affected each stakeholder group in the system, recording where value migrates or is created.

3. We created three alternative scenarios of faster technology adoption, informed by our assessment of changing policy ambition and historical analysis of technology-adoption rates.

Learn more

Contact our authors to learn more about how to create ecosystems that can address societal challenges.

Contents

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