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Digital Planning

Scottish Planning System User Research Phase 2

PROTOTYPE VALIDATION AND ITERATION
NOV 18 - MAY 19

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Executive summary

User research (UR) is an essential part of the programme for the Digital Transformation of the Planning system in Scotland, aiming to provide a **solid, robust, and reliable foundation** based on a **clear understanding of its users' issues and experiences**.

In our **second phase**, the insights captured from the first phase **user research, eDevelopment customer feedback, horizon scanning** and additional sources across the team and wider division were used to inform the creation of a set of prototypes to illustrate the 'art of the possible' in a planning system of the future.

We followed a relatively informal **'design-thinking' based approach** which evolved over a number of iterations as this phase progressed. This allowed us to utilise the insights captured, define the problems to be solved, explore solutions, create the prototypes, and then test.

The prototypes covered much of the **development management process** from applying for planning permission from the perspective of both novice householders to more experienced agents, assessing applications by planning officers, public engagement on local development plans, and planning applications. The final prototype covered **part of the creation of local development plans**.

The latter was quite basic at this time and was iterated much further in **the spatial planning transformation and innovation research** covered in the third summary report.

We then captured feedback on the illustrative prototypes created in a series of **structured walkthroughs with representative users**. These were conducted to validate our thinking and assess how well they had met our initial requirement of illustrating the 'art of the possible', and to further our understanding of user goals and requirements.

Twenty participants took part (there was one no-show) in the feedback sessions. Participants included householders applying for planning permission, to architects, planning officers, major developers, and forward planners.

The sessions were very successful, capturing lots of very rich feedback:

- The **ratings were all positive** with the great majority stating the prototypes illustrated a planning system of the future either 'effectively' or 'very effectively'.
- The majority also stated they would feel **'very happy' about using** something like the illustrative prototype in question, should it be developed.
- The prototypes were described in very positive terms by the great majority of participants.
- A lot of insights were captured on how to improve the designs and better meet user requirements.

This feedback was then used to **revise and improve the designs**, with all other insights captured and stored for future reference.

After this work was completed, we identified a need to expand the prototypes to cover much more of the local development planning process.

This research exploring the innovation and transformation opportunities in spatial planning is detailed in the third summary report.

Introduction

The user research for the programme for the Digital Transformation of the Planning System in Scotland was conducted to provide **a solid, robust, and reliable foundation** for the strategy.[1]

Over the duration of the programme of research, we spoke to over 1,000 individuals across the planning system (both Development Management and Spatial Planning) in Scotland.

Although the research was designed to be broadly representative of the large number of groups involved, including citizens, architects, consultees, major developers, councillors, Planning and Environmental Appeals Division (DPEA) and Planning and Architecture Division (PAD) staff, planning authority staff were central to the research.

As such, broad ranging involvement was essential. From Highland in the North to Dumfries and Galloway and Scottish Borders in the south, a mix of large urban planning authorities, smaller more rural authorities and the national parks were involved in our research.

Figure 1. Infographic of the user research participants

Through the duration of the project the research has gone through different repeating phases of data collection, analysis and insight gathering followed by reflection and consolidation.

These three main phases were:

- **Phase 1: Development of main themes** through meta-analysis of first phase research.
- **Phase 2: Prototype validation sessions** to capture feedback on prototypes created to illustrate the 'art of the possible' in a planning system of the future.
- **Phase 3: Innovation and transformation opportunities in Spatial Planning** investigated through a series of workshops.

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[1] The background to the research, including user research and what it is, our approach, the scale and spread, and user research principles have already been presented in detail in the first user research report covering phase 1 (Development of main themes Nov 17-Oct 18). As such this background is not repeated here other than a brief recap of main points.

Nov 17 - Oct 18
1 - Development of Main Themes

Nov 18 - May 19
2 - Prototype Validation and Iteration

Jun - Oct 19
3 - Spatial Planning Innovation and Transformation

The **first phase report** included a detailed introduction to the user research, the research approach, and a summary of the main findings.

The focus of the current report is **Phase 2: Prototype Validation and Iteration**.

The **final third phase report** focusses on the research and findings of the Spatial Planning Innovation and Transformation research and collaborative work.

Prototype validation sessions: 'The art of the possible'

Delivering the strategy for a Digital Transformation Project is not an everyday task. There is not an established set of guidelines, a template, or rule book to follow.

As the user research progressed, and the implications of the findings were discussed in the programme team itself, and more broadly amongst stakeholders, lots of great ideas started to form around the capabilities, features and technologies to help deliver the transformation needed.

And in communicating the strategy itself, there were a lot of aspects to consider to give as complete a picture as possible. Along with highlighting aspects such as the foundational user research, the service design, data and technology, the roadmap, and the business case, a key part of that was being able to convey the vision of a planning system of the future.

Illustrating the capabilities and user experience

In conversations we had across the Digital Planning Team and beyond, interest was building as to what this vision would look like: "show me, don't tell me".

However, the planning system is not easy thing to illustrate. It is something of a giant with different strategic layers, lots of different parts and people required to deliver the service, including stakeholders, data, technology, processes, and legislation.

Central to the concept of digital transformation is the technology that will deliver this, and the most visually engaging aspects that people relate to are the interfaces and features illustrating the capabilities and user experience that the transformation will deliver.

For illustrative purposes only

With the phase the project was at, we had to be careful that any prototypes would not be interpreted as 'delivery ready' or illustrations of any 'final product'. We were not at that stage of the project, and significant additional work would be required before that were possible, including additional user research.

So, informed by the combination of:

- insights from the **user research**
- **horizon scanning** conducted by Future Cities Catapult (FCC)
- insights on the use and experience of the **eDevelopment portal** via customer support
- considerable **internal knowledge on the planning system**
- the application of **interaction design principles**

We created a series of prototypes to help illustrate the 'art of the possible'; what the system might look like from a user perspective, and the types of experience and capabilities it should be providing.

Design Process

The **initial design process** we followed was a relatively **informal 'design thinking' based approach**. Design thinking is a well-established model first proposed in 1969, though the five-phase model most commonly in use was proposed by the Institute of Design at Stanford and adopted by the Design Council in the UK. The five phases of the model are as follows:

- **Empathise** – with the users of the system. Understand the issues and problems they experience from their perspective.
- **Define** – The user's needs, their problems, and the insights.
- **Ideate** – Challenge assumptions, create and explore ideas for innovative solutions.
- **Prototype** – Start creating solutions.
- **Test** – The solutions created to see how well they solve the defined problems and iterate.

Starting with the findings from the high-level user research, and along with the eDevelopment insights and internal knowledge of the planning system, we began to **define the problems to be solved**. The findings and insights from the horizon scanning were used to help drive the creation of the prototypes, knowing what technologies were available and how they could be used.

The **second iteration** was based on a 'Google Sprint' workshop type approach. This was a more collaborative model involving members of the Digital Planning team, Future Cities Catapult, and relevant Stakeholders.

The workshops started with a review of the user research to define and prioritise the problems in set of 'How might we…' challenges, before starting collaborative ideation and prototyping. At the end of the week, the rough high-level prototypes were tested, and feedback captured.

At this stage there were only a small number of prototypes and screens. The decision was taken to expand these out and address more of the 'How might we…' challenges that had been identified, as well as extend the journeys illustrated by the initial prototypes.

The learnings from the second iteration were applied to expand the 'Design Thinking' approach in our third iteration to having a broader consideration of the 'How might we…' challenges and greater ideation and exploration of possible solutions before creating the prototypes.

The prototypes were then tested and validated to see how well they illustrated the 'art of the possible'.

The fourth and final iteration of the design approach was for the 'Innovation and Transformation in Spatial Planning' research expanded to include a broader analysis of the problems ('How might we…'), and a deeper understanding of the context of spatial planning (PESTLE analysis), and some additional Horizon Scanning research. These insights were used to help frame future scenarios and inform the collaborative design of the resulting prototypes before testing. This approach is discussed in more detail in the third report.

The prototypes

The prototypes that were created in this second phase covered both Development Management (five prototypes) and Local Development Planning (two prototypes) and illustrated the following journeys.

- **Mary's self-build ***: a householder (Mary) wishing to build her own home, identifying a suitable site, finding out what is required, submitting designs, and tracking her application process.
- **Tom's extension ***: a householder (Tom) wishing to build an extension, finding out what is required, finding an architect to suit his project and budget, collaborating with his architect online, including viewing and signing off an augmented reality representation of his extension, paying the fees allocated by his agent, and tracking the progress online.

- **Application process *:** a householder completing and submitting an application, but with a focus on interactive guidance, the use of AI, inline validation and highlighting of constraints to ensure the application is valid on submission.
- **Application assessment:** this prototype followed the journey of a planning officer seamlessly assessing a planning application, using a one-stop solution bringing together all required data, commissioning and viewing drone footage, collaborative viewing and commenting on plans, direct communication with consultees to commission any assessments flagged, and reviewing collated and analysed comments.
- **Public engagement**: a citizen using a sophisticated engagement mobile-based tool that allows him to set locations of interest, keeps him notified/informed of new planning activity in his areas of interest (applications, developments, and engagements), and helps him to engage effectively e.g., through an interactive template for submitting a validate comment. The tool also allows full customisation of alerts and notifications to suit the user.
- **Call for sites**: a major developer using a customised planning portal giving an overview of all information relevant to them including upcoming local development plans, interacting with the development plan, and submitting a site for consideration and assessment (this prototype has since been shelved due to the implications of the planning bill on 'Call for sites')
- **Plan maker:** a forward planner writing a local development plan, accessing a single data platform, and writing policy that is geospatially presented, and also linked into national policy. As part of this journey, prototype then illustrated the highlighting of sites requiring assessment (map-based) and a high-level assessment.

* The first 3 of these prototypes have since been merged into a single 'Application Process' prototype.

Capturing feedback

In the process of creating these designs, as with all designs, design decisions were taken on an almost daily basis – how certain users might go about certain tasks, what functionality might be needed to support this etc. As such, a series of assumptions were made, and a number of questions arose around gaps in our knowledge.
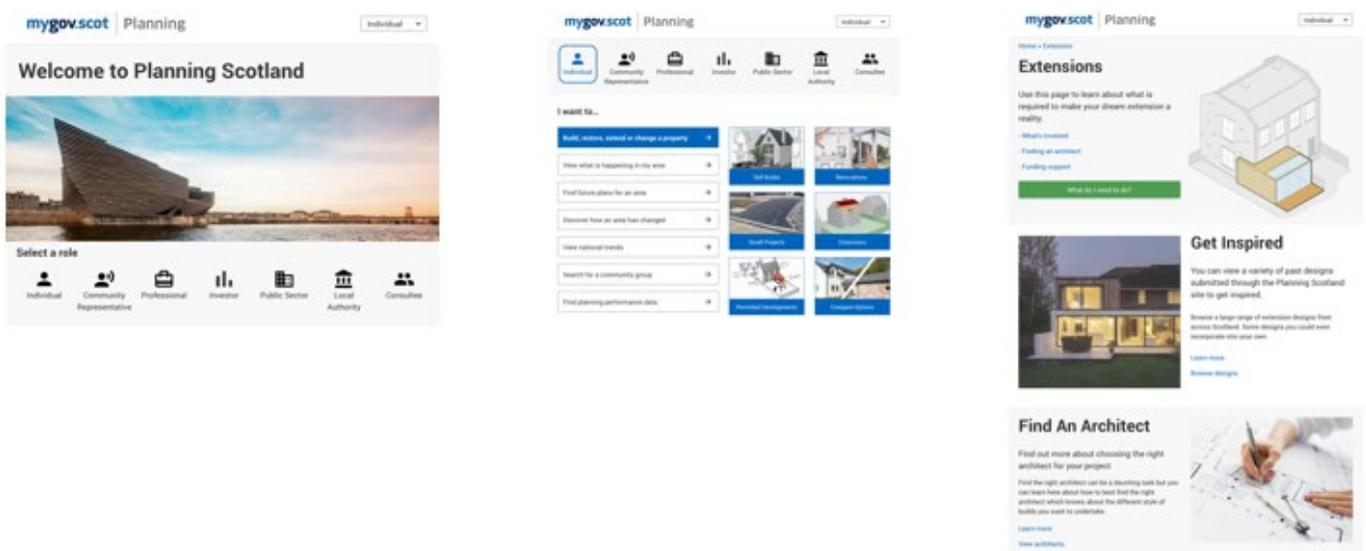

Figure 2. Illustration of some pages from Prototype II, Tom's Extension. This prototype incorporated features such as the single source of planning, interactive guidance, and application tracking.

Along with addressing those gaps in our knowledge, and the assumptions taken, we also wanted to be able to capture feedback on whether the prototypes were fit for our purpose of illustrating the 'art of the possible', and if not, what might need to change about them.

We conducted a series of **feedback sessions as structured walkthroughs**, and **not typical usability tests**. The prototypes were not designed to be usable in their current form, and our aim was to find out how well they illustrated the 'art of the possible'. This approach allowed us to focus on the capabilities, features and functionality they represented, and the perceptions of those.

The usability and resulting user experience will be far more important (and evaluated as such) during the delivery phase.

These walkthroughs were all planned and executed in the same manner and were wrapped in two short interviews.

The first focussed on the existing experience and expectations, and the second around their impressions of the prototype.

- overall impressions.
- likes and dislikes.
- things to change.
- ratings of how well the prototype illustrated the 'art of the possible'.
- feelings if something like the prototype in question were to be developed.

How effectively does the prototype help to show a planning system of the future?

Very Ineffectively	Ineffectively	Slightly Ineffectively	Neither/Nor	Slightly Effectively	Effectively	Very Effectively
1	2	3	4	5	6 ●	7 ●●

If we developed something like this, how would you feel about using it?

Very Unhappy	Unhappy	Slightly unhappy	Neither/Nor	Slightly happy	happy	Very happy
1	2	3	4	5	6 ●●	7 ●

Figure 3. Rating scales used to capture feedback post-walkthrough. The blue dots indicate participant scores from a single session.

As a qualitative piece of user research, with the goal of providing indicative feedback as part of an iterative design approach, large numbers of participants are neither necessary nor cost-effective. And neither are we conducting market research, nor attempting to establish a level of scientific 'proof'.

Over the seven prototype walkthroughs, we captured feedback from twenty participants, including:

- Householders who had applied for planning permission.
- Citizens who had commented on a planning application.
- Architects.
- Planning officers.
- Forward planners.
- Major developers.

Although 3 participants were recruited to take part in the sessions for each prototype, only one participant was unable to take part in their scheduled session. As such, twenty of the twenty-one scheduled sessions took place.

The insights

The insights captured in each session were used in one of three ways:

1. **To revise and improve designs,** this is an essential part of an iterative design process, one where we are continually improving, and refining designs based on direct user feedback and behaviour. This is a key principle of a user-centred design process and one we will be applying throughout the programme.
2. **To broaden our understanding** of user goals and requirements and the functionality and capabilities required to support these. Although this was not a primary purpose of these sessions, any opportunity to capture insights of value to the programme is always welcome and should be taken. Capturing insights in an incremental manner and being able to subsequently validate them, is far more effective than trying to establish them all at once.
3. **To establish if they illustrated the 'art of the possible'** of a future planning system.

The sessions allowed us to capture a lot of learnings in the second category, especially around the prototypes highlighting the planning officer and forward planning journey. It is not our intention to give a detailed breakdown of the insights in this report as the feedback is rather extensive and needs to be given in context of the designs themselves.

However, some of the insights will be presented with narrated videos of the prototypes highlighting the user journeys, features and capabilities, and user experience on the Transforming Planning website in the 'Visualising a Future' section within 'Digital Planning'.

The feedback captured on whether the prototypes illustrated the 'art of the possible' in a planning system of the future was very positive, as shown over the page.
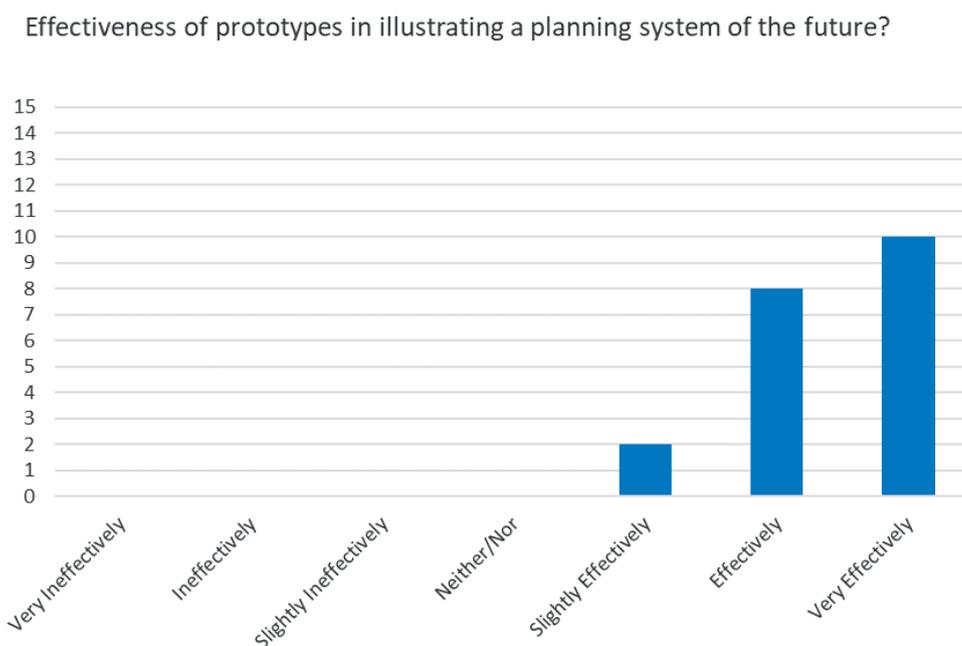

Figure 4. Combined effectiveness ratings for how well the prototypes illustrated a planning system of the future (n=20)

Overall ratings were positive with half stating the prototypes illustrated a planning system of the future 'very effectively' (above).

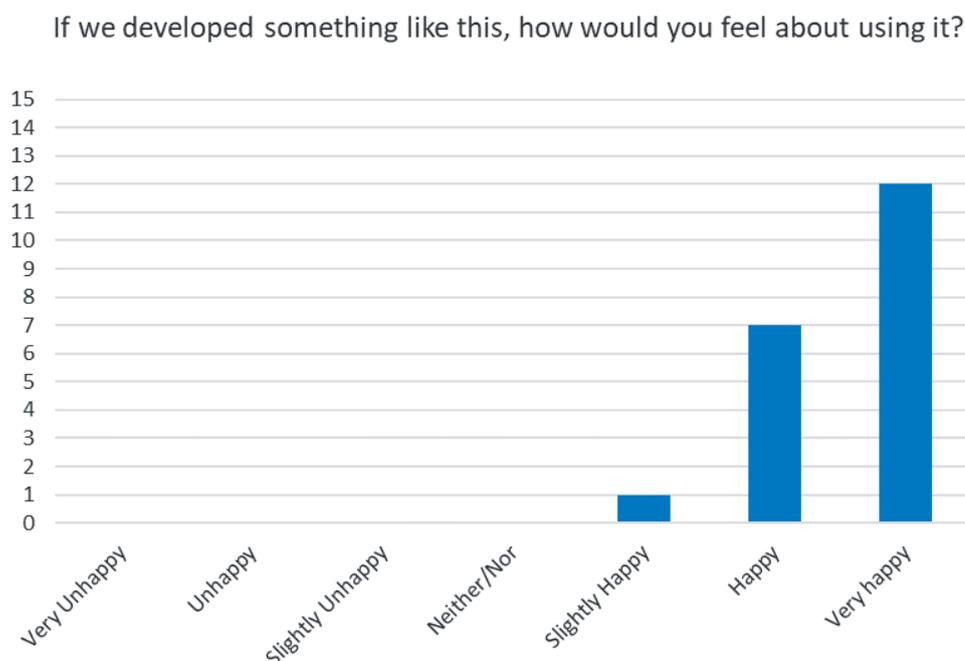## If we developed something like this, how would you feel about using it?

Figure 5. Combined ratings from participants on how they would feel about using something like the prototype, were it to be developed (n=20))

Indeed, the majority of participants would feel 'very happy' about using something like the illustrative prototype in question, should it be developed.

Finally, participants were asked to use 3 words to sum up their perception of the prototype that had been the subject of their walkthrough (below).

Figure 6. Word cloud from the final summing up of participants perceptions of the prototype they had seen. Size denotes frequency of incidence. (n=20)

The feedback, despite being only indicative, was very encouraging for the programme, along with the other invaluable insights captured.

All of the designs have since been revised and refined based on the feedback captured and we are planning to conduct a second round of validation on the 'application assessment' prototype which has changed and expanded significantly since the original sessions.

Innovation and transformation opportunities in Spatial Planning

After the completion of the prototype validation sessions, the data and insights were captured, analysed, and systematically used to update the designs. Additional insights were also logged for future reference.

During the subsequent period of reflection, one of the tasks we undertook was a gap analysis on the prototypes and the planning system to see what areas we had covered and what we should address next. Combining this with feedback from planning authorities that were keen to see more in spatial planning and local development planning, an obvious outcome was to look to create further prototypes in this area.

Further research required

An unintended consequence from our earlier validation sessions was the realisation of the disparity in our knowledge and insights related to spatial planning compared to development management. For the latter, in addition to the user research, we also had almost 10 years' worth of data and customer insights through the e-portal and operations team. However, we had nothing comparable in relation to local development planning, where the majority of solutions, tools and technology are acquired, provided, or created by the planning authorities themselves.

It was obvious we had to conduct further research to fill these gaps in our understanding before doing any more prototyping to illustrate 'the art of the possible' in spatial planning.

We already had some very valuable insights from our earlier workshops and interviews, which looked at the issues and opportunities around local development planning in key areas (engagement, preparing and processing, presenting the plan and making it accessible, and monitoring and delivery), so any further research had to build on this.

The Spatial Planning Innovation and Transformation Research is covered in our third report.

Research Programme Reporting

The current report is the second of three that summarise the user research conducted to inform the development of the strategy for digital transformation.

In **Phase 1: Development of the Main Themes,** the bulk of research was conducted with a very broad spectrum of user groups across both Development Management and Development Planning to identify the main issues and opportunities experienced by users of the planning system. These users included Householder Applicants, Planning Officers, Architects and Agents, Major Developers, Statutory Consultees, Enforcement Officers, Local Councillors, Citizens engaging with planning, Infrastructure groups, and DPEA.

These insights formed the foundation of the transformation programme and were used in second phase to drive the prototype validation and creation.

In **Phase 3: Innovation and transformation opportunities in spatial planning** (the next and final phase) a series of workshops with Academics, PAD Development Planning team, Forward Planners and RTPI Young Planners were conducted to explore the future landscape, constraints, and scenarios in spatial planning.

The insights and findings from these workshops were then used to drive some collaborative design sessions with Forward Planners. The designs and ideas captured were developed further into illustrations of the 'art of the possible' for the future of spatial planning through the development of prototypes, storyboards, and other design artefacts.

We then captured feedback on these prototypes in a similar way to phase 2 and iterated the designs.

All research reports can be found in the Informing the Strategy - User Research section of the Transforming Planning website.

Acknowledgements

The publication of this report marks something of a milestone in the user research of the [Transforming Places Together: digital strategy for planning](#) digital transformation programme.

It would not have been possible without the involvement of a large number of people; from all the research participants giving their time, enthusiasm, and detailed feedback, the prototypes created by Alastair Mitchell bringing the research to life and illustrating the 'art of the possible', to all the rounds of reviews and proof-reading conducted by colleagues across the digital planning team, leading to the publication of the three reports.

In all this, I would like to especially highlight the contributions of my two Service Design colleagues, Stephen Adam, and Braden Tinline, who worked with the digital planning team at different times and assisted with the user research.

Their input to the planning, feedback capture, analysis and illustration of the insights and general unending enthusiasm for their discipline, the programme and uncovering the findings were essential components to making this research happen.

Appendix

User research activities and participants

Development Management participants

Date	Activity	n	Location (s)	Outputs/Data Illustrations	Comments/Notes
Nov 17	Householder Planning Application Workshops *2	20	Edinburgh & Inverness	Raw data & Key themes Customer Journey Map Storyboards Opportunity Map 1	All had submitted a planning application themselves or through a planning professional. *Recruited via agency to agreed profile.*
Nov 17	Commenter Workshop *1	10	Glasgow	Raw Data & Key Themes Customer Journey Map Opportunity Map 2	All had commented on a planning application, either local or major (50:50). *Recruited via agency to agreed profile.*
Dec 17	Architect Interviews	5	Telephone/Remote	Raw Data & Key themes Storyboards Opportunity Map 1	Practising architects or technicians. All SMEs (1-25 employees) and various locations across Scotland. *Recruited via internal PAD contacts.*
Dec 17	Planning Authority Process Mapping Workshops *5	55	Edinburgh, Glasgow, Inverness, and VC session.	Process Map & Findings	24 x PAs across Scotland, 2 x NPAs and DPEA. Initially recruited via internal PAD contacts with participants nominated by the respective Planning Authority.
Feb 18	Planning Authority Application Experience Workshops *2	19	Glasgow & Dundee	Raw Data & Key Themes Storyboards Opportunity Map 1	Focussing on the human experience of processing planning applications with a mix of Planning Officers, Admin and Tech. *Initially recruited via internal PAD contacts with participants nominated by the respective Planning Authority.*
Feb 18	Developer Major Application Workshop *1	8	Glasgow	Raw Data & Key Themes Process Map Opportunity Map 2	All participants completed and submitted planning applications for Major Developers. *Recruited via Homes for Scotland.*
July 18	Statutory Consultee Workshop *1	10	Edinburgh	Raw Data & Key Themes Opportunity Map 2	All had significant experience interfacing with the Development Management process. 2 participants from each of the 5 statutory consultees - SEPA, Scottish Water, Scottish Natural Heritage, Historic Scotland, Transport Scotland. *Initially recruited via internal PAD contacts with participants nominated by the relevant Consultee.*
Aug 18	Councillor Interviews	6	Telephone/Remote	Raw Data & Key Themes Opportunity Map 2	All had experience on Planning Committee, Full Council and LRB including some conveners. 25 had initially agreed to take part but 19 were unable to attend on their agreed timeslot. *Recruited via HoPs and internal PAD contacts.*
Aug/Sept 18	Enforcement Officer Interviews	2	Telephone/Remote	Raw Data & Key Themes Opportunity Map 2	All were active Enforcement Officers. *Recruited via internal PAD contacts then Enforcement Officer's forum.* All Enforcement Officers were invited to take part.
	Total	**135**			

Spatial planning (Local Development Planning) participants

Date	Activity	n	Location (s)	Findings	Comments/Notes
Jan 18	Citizen LDP Awareness and Engagement Survey	800	Across Scotland	A&E by Income Band A&E by Employment Status A&E by Age Group	Respondents recruited (*through agency to agreed demographic indicators)* across Scotland to be representative of gender, education, age, employment, and income spread. Locations were primarily central corridor (Glasgow and West to Edinburgh and East), Fife, Falkirk, Perth, Dundee, Angus, Aberdeenshire, and Inverness reflective of the more populous areas.
Mar 18	DPEA/PAD Interviews	7	Telephone/Remote	Raw Data & Key Themes Opportunity Map 3	Including 3 DPEA Reporters and internal PAD staff on admin and decision making. *Recruited via internal PAD contacts.*
Mar 18	Planning Authority Forward Planner Workshops *2	23	Edinburgh & Stirling	Raw Data & Key Themes Opportunity Map 3 Process Map	Participants 10 different Planning Authorities, with a mix of Planners, Tech and Admins. Initially recruited via internal PAD contacts with participants nominated by the respective Planning Authority.
Jun 18	Citizen LDP Awareness and Engagement Workshops *2	20	Edinburgh & Glasgow	Raw Data & Key Themes (Aware) Raw Data & Key Themes (Engaged) Experience Map	Focussing on the experience, motivations, and barriers to engagement within aware and engaged groups. This was the qualitative side of the Awareness and Engagement Survey (quantitative). *Recruited via agency to agreed profile*s.
July 18	Statutory Consultee Workshop *1	10	Edinburgh	Raw Data & Key Themes Opportunity Map 3	All had significant experience interfacing with the Local Development Planning process. 2 participants from each of the 5 statutory consultees - SEPA, Scottish Water, Scottish Natural Heritage, Historic Scotland, Transport Scotland. *Initially recruited via internal PAD contacts with participants nominated by the relevant Consultee.*
Aug 18	Major Developers Workshops *2	7	Glasgow & Edinburgh	Raw Data & Key Themes Opportunity Map 3	All participants had good experience interfacing with Local Development Planning Process. *Recruited through Homes for Scotland.*
Aug/Sep 18	Infrastructure Providers Interviews	7	Telephone/Remote	Raw Data & Key Themes Opportunity Map 3	Participants invited to take part from across Green networks, Telecoms and Energy providers. Transport Scotland, and Scottish Water had already taken part in the Statutory Consultees workshop. Approx. 4-6 from each group were invited to take part. *Recruited via internal PAD contacts.*
Sep 18	Community Planning Managers	4	Telephone/Remote	Raw Data & Key Themes Opportunity Map 3	All Community Planning Managers were invited to take part through their central contact. *Recruited via internal PAD contacts and professional contact list.*
	Total	**87**			

Prototype validation sessions

Date	Activity	n	Location (s)	Findings	Comments/Notes
Jan – Feb 19	Facilitated Walkthrough of 'illustrative' Prototypes I	20	Remote via WebEx	Session findings and insights x 7	Citizen respondents were recruited through a third part agency to agreed profiles for householder applicant and commenter. Planning Professionals were recruited through all previous research contacts for the required user profiles.
Oct 19*	Facilitated Walkthrough of Illustrative Prototypes II (Spatial Planning)	5	Remote via WebEx	Session findings and insights x 2 (to be produced)	Forward Planners were invited to take part from all Planning Authorities

Innovation and transformation in spatial planning workshops

Date	Activity	n	Location (s)	Findings	Comments/Notes
Jun – Sep 19	Innovation and Transformation in Spatial Planning Workshops (4), and Collaborative Design Sessions (2)	35	Dundee, Edinburgh & Glasgow	In progress - TBC but likely: Raw data Storyboards Prototypes	Respondents recruited through existing contacts: Academia/University – 8 PAD Development Planning Team – 3 Forward Planners – 12 RTPI Young Planners – 6 Collaborative Design (Forward Planners) – 6 All Planning authorities were invited to take part for each round. RTPI Young Planners were mainly committee members. The main criteria was having an innovative and forward-thinking viewpoint on planning and related technology.

Totals:

Research Participants	**- 1073**
Workshops	- 25
Interviews	- 27
Prototype Validation Sessions	- 25
Surveys	- 1