

Smart Waste Tracking Digital Challenge event on 29 June 2018 – questions raised (updated to include questions from the online forum on 10 July)

Updated - understanding what is meant by waste tracking - electronic paperwork or electronic dongle/tag?

We want a solution that enables businesses to record or collect the most useful data on most movements of waste that they handle. We don't mind what the technical solution is, it is up to you to tell us. The building blocks of the data we are looking for are what the waste is, where it is from, who handles it, where does it go and what happens to it. This might be recorded through electronic documentation or through alternative means of technology. We must emphasise that the solution should work both for businesses that don't have any systems, but also for those which already have a system in place, in effect something that 'talks' to and collects data from an existing system. We also want something that makes data useable and understandable both to the regulator and government.

Coverage: directive waste only?

Initially this only covers directive waste, but we would like to think bigger, so we are looking for solutions that can be scaled not just for other types of waste but that may also present other reuse opportunities.

Updated - level of detail requirement for tracking household waste

Data from household waste should be at local authority level. This means it can be collected at a reasonably aggregated level compared to commercial or industrial waste where we are interested in individual waste transfers. We aren't expecting a breakdown of data per household. Information could be collected from lorries or waste transfer stations or the point at which the waste is first collected.

Updated - understanding requirement on tracking individual waste arisings through to End of Waste (EoW) status

We want to understand final destinations for waste material and being able to track this from source through to end destination. If any solutions are good enough to show EoW status this would be an added bonus. The types of questions we get asked, for example include for household waste how much is generated, what is reused, recycled, incinerated,

and what goes to landfill. We could get asked the same questions on commercial and industrial waste or on individual waste streams, such as how much plastic is being generated and how is it treated, so this is level of detail we are interested in.

Updated - live data

From an enforcement and compliance perspective we are interested in real time but understand that isn't always possible. The driver for this is that the regulators are saying the more current the data, the easier it is to stop things going wrong and intervene. Live data isn't as important from a policy perspective or for calculating annual recycling rates, for example. To answer the question it is not something that has a hard and fast definition but from a regulatory perspective it is important to see what is achievable.

How much data will be accessible to people, so that we can see how to develop the solution for you?

Duty of Care transfer notes must be stored by waste companies and provided if requested by the Environment Agency. However, they are not routinely required to be sent to government, so we don't have this data available.

Regulation covers the minimum information that must be included in the transfer note, but there is no specific template. For example, it is acceptable to record the information on pieces of paper.

In England there is also a returns system for hazardous consignment notes, but this is done differently across the four nations. For example, Scotland and Northern Ireland use a pre-notification system - samples may be available.

Are these documented anywhere?

Example templates are available on the various government websites.

Updated - availability of example datasets

We have templates which show how data may be recorded and examples of information recorded on waste transfer notes and hazardous waste consignment notes with links to these which can be found in the supplementary briefing pack. We don't have data sets available to test against but will look at that as individual questions come in.

Part of the reason for this project is we don't have the data we need in an easily accessible format which means we don't have a dummy of our ideal data set. We have identified what we think are the important data fields (see supplementary brief) however this work isn't yet complete and we hope to work on this with the successful bidders.

Updated - use of datasets based on non-UK activity

If you want to show that your solution works and you have data sets available that match the fields you think are most important to test it, we don't see why it would be a problem to use datasets from outside the UK.

Updated - dummy data

It is certainly a possibility to set up and provide. The question here is what are the most important data fields in a minimum viable product that we want to collect.

Updated - availability of raw data (redacted format) from the different systems used by businesses

We can make this available but not in time for bids closing. This will be available in time for the 5 successful companies starting in November.

Updated -presumably different systems collect broadly same data?

We would expect that the various different systems would collect broadly similar data to the extent that regulations require certain data is collected both for non-hazardous waste under waste transfer notes and for hazardous waste under consignment notes. The fields requested by regulation are set out in the example templates we linked in the supplementary information and these should generally be the same across different systems.

Updated - availability of data sets outside of Defra/Government to assess potential fraud

There are ways to identify fraud using parameters within the data sets without using external data, but this isn't something we have looked at in depth as yet. We can't promise access to external data i.e. HMRC data. When data is reviewed by auditors there are lots of clues that indicate something is wrong such as strange time stamps, descriptions of waste and patterns of transfers that don't make sense.

There may be external data sources but we have not explored at this stage. If through this process we identify valuable dependencies on data owned by another part of government we may be able to come to an agreement to access this data.

Updated - existing data strengths and weaknesses

In terms of local authorities we are reasonably confident with the data that is reported. Where local authorities tell us they struggle to report data is where waste goes through various treatments such as sorting at a material recovery plant or for mechanical biological treatment, then it may get passed on to a broker and at this point they can struggle to get the information on final reprocessors. Commercial sensitivities can sometimes be

cited. With a system where every 'handler' required to report, the onus would not be on the local authority to report for the whole chain.

Commercial and industrial waste would go through similar sorts of treatments and processes but we don't have an equivalent system where we ask the big waste management companies to report to us. So at the moment we rely on quarterly returns from permitted sites however but a lot of waste goes to exempt sites, (who don't need a permit). There are around 90,000 sites registered and we get no data from exempt sites.

Updated - data quality requirements

Local authority data reported through Wastedataflow is generally regarded as high quality data so yes ideally we are looking to achieve a similar level of quality. Commercial and Industrial data is not collected in this way. England and Wales have previously conducted surveys; Wales still use that approach whereas England use a Reconcile methodology, which uses to a large extent permit data returns but we also make use of a number of other data such as waste exports and packaging data.

At an individual transactional level we are looking to achieve a good level of accuracy. We know with the nature of the waste and the way it gets treated, and at certain points in the waste chain waste from different sources combine and imposes some practical constraints on full traceability on originating source. So some level of apportionment or factors applied in these circumstances would be entirely acceptable.

One of the problems we know of is the accuracy of recording against particular list of waste or EWC codes which is where online validation may help address this issue.

We may need to vary the levels of accuracy, for example, at proof of concept stage we may be willing to accept a broad or lower level of accuracy to demonstrate viability but over time we might want the flex with ability to scale and refine.

Updated - number of transactions and waste movements

As we understand it, when that figure of 23 million transactions was calculated it meant transfer from one waste holder to another, not the complete chain, not even necessarily the complete first part of the chain. Waste transfer notes work in that you are transferring from transferer to transferee, that could be the person that holds the waste to a waste carrier. In principal in the regulations you need another waste transfer note to go from the carrier to the destination site. This is something we need to look at as it makes much more sense for there to be a 3 party transaction for non-hazardous waste, which links the first party to the carrier to the destination party because this is the way it currently works for hazardous waste consignment notes.

As far as we are aware all waste arisings should be covered by waste transfer notes; not immediately obvious of any that are not.

Updated - existing proportion of digital vs paper records

We don't know the relative proportions of digital vs paper records but there is a real mix. Some businesses have very sophisticated systems whilst some still use paper. Auditing waste transfer notes can take regulators weeks of work and thousands of pounds worth of time.

Updated - range of systems that exist for businesses that already collect data

We conducted a survey with waste businesses during the discovery phase and asked this question. We had several hundred responses which we haven't as yet analysed in detail however there were lots of bespoke systems tailored to the individual needs of the business. We will have a sample soon of examples of what all different businesses, from large to small, across the waste chain use.

Updated - market share of waste managed by large businesses

We don't have hard figures on the proportion of waste managed by large companies but as part of discovery work when we engaged with the larger businesses they said they wouldn't hold more than 10% each of the market therefore as a very broad estimate we would say around 60% of the market.

Updated - typical number of waste treatment processes

In most cases looking at single digits for the number of different waste treatment processes that waste may undergo. Experience from reporting by local authorities through WasteDataFlow (excluding transfer stations) would be up to 5 or 6 different stages so would think it only be in rare cases would it go above 10. There are cases when some waste gets collected and goes straight to landfill or an incinerator.

Scope to adapt the waste transfer notes

Defra are considering the scope for reforming Duty of Care as part of the Resources and Waste Strategy. If that were to happen, we could look at changing the information requested through waste transfer notes.

Whether solutions will require changes to government regulations

We can't promise that we can change government regulations to support these new digital solutions, but we will look at this in parallel with the digital work and are open to considering it.

How any innovation would work without regulatory changes – timescale especially in the wake of Brexit

This competition is about finding innovative IT solutions. But alongside this, we will be looking at all the other things that need to change, and at a UK level, the Resources and Waste Strategy gives us an opportunity to do this.

If through this competition we can show that solutions are out there that can deliver waste tracking, then that also helps make the case for wider regulatory changes to support waste tracking.

Ensuring systems do not end up like the Universal Credit system

Make sure that you focus on the system and what is required.

Think about the Minimum Viable Product (MVP) – how do you collect data that is more useful to us?

Start small, build collaboratively and in small steps.

We appreciate that government also have a responsibility and we expect to work closely with you.

‘Innovative’ - is that for the technology industry or the waste industry?

Any solution needs to be useful for the waste industry and be a new solution for the market, but the technology doesn't necessarily need to be innovative.

The challenge is outcome-focused rather than technology-focused.

Updated - Technology restrictions and preferences

There are no limits on the solutions we are prepared to look at. That said we do have preferred technology stack for working with new digital services (those that sit on gov.uk that need to be compliant with gds service standard). We have a preferred set of tools that we like to work with, for example if you are proposing a digital service that may end up on gov.uk and may need to comply with the service standard. We would consider as exceptions proposals that don't comply.

Defra has a framework of Common Technology Choices (CTC), or technology preferences that our teams work with when building and supporting new digital services.

The framework is continually under review and is underpinned by an exception and approval process, arbitrated by subject matter experts within our technology teams.

For the purposes of GovTech proposals, if you are submitting a proposal that envisages the creation of new digital service that will sit alongside other Defra digital services on

GOV.UK, then be mindful of the CTC Framework. Be ready to justify exceptions (and have a fall-back plan in place in case your exception is not granted).

Technology	Defra preference
Agile delivery	Jira Trello VSTS Yammer
Automated test tools	Jmeter, Selenium and Cucumber SonarQube Browserstack
Code version control	Consolidate on Git Defra GitHub for all open code Private GitHub, GitLab and VSTS Git
Common platforms	tbc
Continuous integration	Jenkins VSTS
Customer platform (CRM)	Dynamics 365
Databases	RDS and Azure PostgreSQL SQL Server Azure Cosmos DB (interim NOSQL Solution)
Development languages	Node.js using Hapi for new online Digital Services C#.Net to extend commodity platforms (.Net Core wherever possible)
Hosting	Cloud First AWS and Azure
Integration platform	Always look at Dell Boomi first for integration options assessment Local AWS and Azure facilities where strong technical fit
Prototyping	tbc
Service analytics Service monitoring/management	Google Analytics LogicMonitor ServiceNow
Service design	tbc
Test management tools	Jira VSTS

Aligning your data in a standardised format

There are data programmes within the UK Environment Agency looking at this.

We would like you to help us identify gaps and issues that we need to be addressing, as well as opening up other opportunities.

Our ambition is to link systems and data together seamlessly.

Duty of Care – in terms of EWC Codes – will this change as a result of Brexit, if we build on the ‘current state’?

The government wants the waste sector to continue to work as it does now post EU Exit that is that all current systems continue to work as they do now.

During proof of concept we would want those types of dependencies to be called out, so that we can have appropriate conversations with the policy teams.

Edoc system – success or failure?

Edoc is an online government system for companies to digitally record their waste transfers. It is fine for its intended purpose – as a way of recording and submitting waste transfer notes digitally. However, now that waste policy has moved on, it does not help to answer the current questions around waste crime and where waste ultimately ends up.

Edoc has around 8,000 registrations. It is largely used by a small number of local authorities and medium sized businesses to manage their waste transfers with clients, but it's not very useful for statistical uses as a regulatory tool for policy makers, in terms of providing the data that we need.

It does quite a lot but it doesn't help to answer what we are talking about today. It allows companies to track non-hazardous, commercial and industrial waste but it doesn't cover hazardous waste or household waste. EDOC doesn't provide much tracking functionality but it allows companies to record their waste transfers to ensure they are complying with the law. There are lots of good features about EDOC and lots of interesting parts to it. One of the big challenges we had from some of the larger waste companies is that it's not easy to work with their systems and therefore they are not going to use it.

ROI model – are numbers available, is a £per tonne model being looked at?

Phase 2 is about the business model: looking at customers and revenue streams to deliver profit, rather than in Phase 1.

The GovTech team will be with you as you go through this phase, and will help you with this.

Land fill tax – are these projects to be built as a trade off against cost, for example, savings via avoiding landfill tax evasion? What would be deemed an acceptable cost benefit ratio?

We will look at the cost-benefits as the project progresses.

In terms of existing work, it may be useful to note that the Environment Agency has published an evaluation of the cost-benefit of work to tackle waste crime:

<https://www.gov.uk/government/publications/waste-crime-interventions-and-evaluation>

Waste from construction and demolition - how important is it that the solution can cover this?

Construction and demolition waste should be covered by the solution.

It should track anything that is currently captured via waste transfer notes or hazardous consignment notes.

Waste crime: is there likely to be any personal risk from being responsible for a solution that reduces opportunities for waste crime?

There can be some unpleasant individuals and many are also involved in other areas of crime.

There is unlikely to be an immediate risk, but Defra and GDS will support appropriate risk assessments as necessary and consider any mitigations.

200 million tonnes of waste are produced each year – what about unknown quantities processed under exemption, where people are not required to have a waste note?

While sites with exemption registrations don't need to submit waste returns, all movements of waste do need to be recorded via transfer notes. Therefore, an effective digital waste tracking solution would eliminate the need for site returns, as the data would already be captured.

Composition of waste in the local authority area – is this part of the exercise, or do Defra know this already?

This exercise is not about looking at the composition of kerbside collected waste, for example, co-mingled collections or residual waste. This is being addressed by Defra through separate research.

Updated - Level of detail expected for waste undergoing processing and whether aggregates of outputs are acceptable

If we are to use this system to report against recycling rates we need to know what has been accepted and what has gone into the recycling process. For example if waste goes to a site and gets rejected because it was contaminated and ends up in landfill, potentially we need to know what material actually went into the recycling process and what by-products or contaminated products were diverted to incineration or landfill.

We know there is a significant challenge when waste gets to a facility but is mixed with other sources. We are looking at what practical solutions are available but potentially if we know broadly what the composition of waste types going into a certain facility from certain sources and know the 3 or 4 different onward destinations then end destinations can be calculated. Using a standard apportionment is absolutely fine.

Updated - Apportionment rules for waste from different sources and streams

We are looking for the apportionment of waste from different sources this to be an inbuilt function of system, so for instance if you take 10 tonnes of C&I waste and 10 tonnes of household type waste this would be apportioned in the system on a 50/50 basis. As long as there is functionality within the system to allow for this, DEFRA will work with businesses to look at suitable 'rules' for how this would be done.

Making data available to producers/agencies

If you are proposing a new data capture system, then any data that is captured will need to be accessible to all those that handle the waste that the data refers to in the chain, as well to regulators.

We may also wish to make some of this data available more widely at an aggregated level.

Any data capture system will need different levels of access for different users, and the flow of data through that system needs to be flexible, adaptable, configurable and secure.

EDOC provides a model for this that could be a useful starting point: <https://www.edoconline.co.uk/how-to-use/>

Cross border movement

Yes, it is possible. This is likely to require accounting for Basel codes as well as EWC.

Delivery timescales for the proposals

We aim to start Proof of Concept (POC) in November 2018, which will last for 12 weeks, then we will evaluate the outcomes. Two projects will then be chosen to move into Alpha phase, for up to 12 months.

You need to break the product down into something that we can test, so that it can then be built up over time in an iterative process to achieve the fully designed system/solution. A Minimum Viable Product (MVP) would be acceptable at the end of Alpha.

Updated - Registration process for multiple proposals by the same applicant

Yes – Innovate UK have said that applicants need to contact the support team for multiple proposals. It should be one idea per application.

Updated - Requirements on naming individuals working on the project during phase 1

Guidance on requirement to include exact names for team members who will be working on this can be found in the application process on the Innovate Portal.

Uploading extra documents or videos into the application portal?

No supporting documents, just text in the boxes provided.

Pictures can be added (within a specified page limit) but no videos.

Case studies

You can refer to them as part of your application.

It will be possible to include links within your application, but it would be better to enter the relevant details as part of your application text.

Bear in mind that we will have a limited amount of time in which to assess the applications, and it would be unfair to other applicants to spend a disproportionate amount of time on one application.

Technology/digital – can Phase 1 be about developing the best POC, then Phase 2 be about working with partners to develop an MVP?

Phase 1 is about anything to do with feasibility.

If you are the prime contractor then you might be able to bring a partner in to help with the Phase 2 work.

Updated - Essential requirements to demonstrate successful proof of concept

These aren't defined so it is hard to be specific. It would have to show a level of viability for us to invest further but it is difficult to say what this might look like. The original competition bid sets out the high level features we are looking for which will help.

One of the main things is to make the solution viable to larger businesses who want to be able to use their own systems and for us to be able to extract data rather than them having to enter data separately into another system. We need to capture relevant information and be able to track this through the supply and treatment chain to see what happens with waste from production to the end destination. The data structure and data analytics have to provide easy and flexibility for reporting and data interrogation. In summary it is about finding a way to work with the systems businesses have, and making it easy for those who don't have systems to collect the data we want. The solution should link transactions so that we have real tracking, make data useable and accessible at different levels – to the regulator, government and businesses.

We wouldn't expect this to be ready at proof of concept stage phase but would need confidence these things are achievable.

Including regulatory changes/suggestions as part of an application

It would be useful for you to flag these things to us if you think that we could do things differently, or if processes need tweaking to make them more effective.

We anticipate that there will be a need to make using the system mandatory, as well as making changes to the information that has to be recorded. But if your application is dependent on radical changes to the regulatory system that go beyond this, then this might mean we judge that it is not deliverable.

Accessing user groups/stakeholders – we don't want five organisations to engage with and potentially upset the same stakeholders

Yes

We have already started some of this discovery phase work already with user groups. But if you have a panel to talk to, then state that in your application.

You will have a stand up team to work with (including a Project Manager) so we will reach out to different stakeholder groups and get the information that you need as best as we can for you.

Any data requested from the stand up team will be made available to all of the Beta phase teams. (Any data that you already have private access to will not need to be shared with the other teams).

If we have already done some work on waste tracking and have some existing data sets that are commercially sensitive, do we need to offer it up to the other four successful companies?

No.

Waste tracking: can existing work be shared

The User Research work is not quite ready to share yet. We want this to be ready to share to the successful five organisations.

Expanding the question/solution - do you just want us to answer the question, or to expand/scale/suggest more? For example, to suggest expansion to cover re-use as well as recycling/disposal?

Yes it would be beneficial if you suggested possible expansion of the MVP as you see it.

Addressing all/part of the problem – if we suggested geographical areas to do a deep dive in, would that be ok?

Yes if you could prove that it would work and that it would demonstrate a clear pathway ahead for scaling up.

In Phase 1 what is the emphasis on existing data? For example, integration with existing systems?

Phase 1 is about starting to understand the scale of the issue and how to solve it. It is about referencing rather than proving at this stage - showing that there is a feasible approach and process.

We would recommend asking for examples of the existing data/transfer notes.

Look at testing something small in Phase 1 i.e. prototype, ready for Phase 2.

Administrative cost of gathering the data – would Government pay?

If the proposed internal delivery team that are stood up for you are able to deliver this for you, then yes.

If they say no, then it would be down to you to fund; costs for data sourcing could be part of the application.

Including a high level concept design into the application

Yes and suggest what planning you would do to achieve the concept.

Calculating fair value costs – using the Innovate UK standard costs for this?

Yes. Innovate UK standard costs should be used.

Points to note

The contract is the contract and it will not be changed under any circumstances. If you feel that you do not agree with it, or you cannot work within it, then you should not send in an application.

Innovate UK will not talk to people directly about their application. However, technical support may be available through knowledge transfer networks or online support:

<https://apply-for-innovation-funding.service.gov.uk/info/contact>

***Updated* - Contact point for the project**

There is a single point of contact and questions or queries should be sent to the waste tracking mailbox Waste.Tracking@defra.gsi.gov.uk. All 4 nations and the Regulators are working together on this project and questions will be directed accordingly.