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A National Metrics Library for the Built Environment: Strategy for Implementation

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Executive Summary

Our built environment plays a key role in our society and environment. The built environment accounts for 40% of global energy use and 30% of global greenhouse gases. The performance of our built environment directly supports social, environmental and economic outcomes for society.

Across the built environment, clients, industry, and academia are exploring new ways to measure performance throughout the asset lifecycle. As the methods of design, delivery, and operation of buildings and infrastructure become more complex, so to have the ways in which we define, document, and analyse the performance of our assets.

New capabilities and technical solutions are developing, providing greater insight into the overall impact of the built environment and, in turn, helping to improve outcomes. However, our approach to performance measurement remains siloed by initiatives, lifecycle stages, thematic areas, industry sectors or geography which stifles its ability to improve performance. Greater collaboration, alignment and dissemination of best practice is required to support the ongoing evolution of sector capability, enabling greater performance improvement.

The opportunity exists to consolidate existing and future methods of measuring performance through coordinating, hosting, and disseminating a national library of performance metrics for the built environment.

The vision for the UK National Metric Library (NML) would be as follows:

“The UK National Metric Library is a national structured repository of quantitative and qualitative performance metrics for the built environment. It will support coordination, innovation, knowledge sharing and dissemination of best practice to improve how we measure sustainable performance across the asset lifecycle.”

This strategy paper presents initial research findings on the value of the UK NML for the built environment, models for delivery and key recommendations for the development and launch of a future NML.

1. Introduction

1. Introduction

1.1 What is a National Metrics Library (NML)?

For the purposes of this paper, a metric is defined as a quantifiable measure used to track processes in order to assess their performance level.

In the context of this paper, we consider different metrics to assess the performance in the delivery and operation of our assets within the built environment. There are hundreds of these metrics due to the complex lifecycle processes of our assets, stakeholders, and variable value drivers.

The proposed NML would be an open access industry resource providing a searchable and indexable library of metrics that can be used to measure the performance of our built environment across the asset lifecycle. This would support clients and industry to identify appropriate metrics and assess the performance of design, delivery, operation, and disposal of our assets. Since the formation of the Construction Leadership Council National Metrics Library Group (CLC) as a sub-group of the CLC Performance Group, the group's work has been recognised and referenced within the Transforming Infrastructure Performance Roadmap to 2030 report, published by the Infrastructure and Projects Authority in September 2021.

“Develop alignment and integration between Government Construction Metrics and the National Metrics Library (National Metrics Library referenced within the Value Toolkit and is currently under development by the Hub, Scottish Futures Trust and the CLC).”

If the NML existed for the built environment, it would have multiple use cases to support wider industry development as shown in Figure 1.

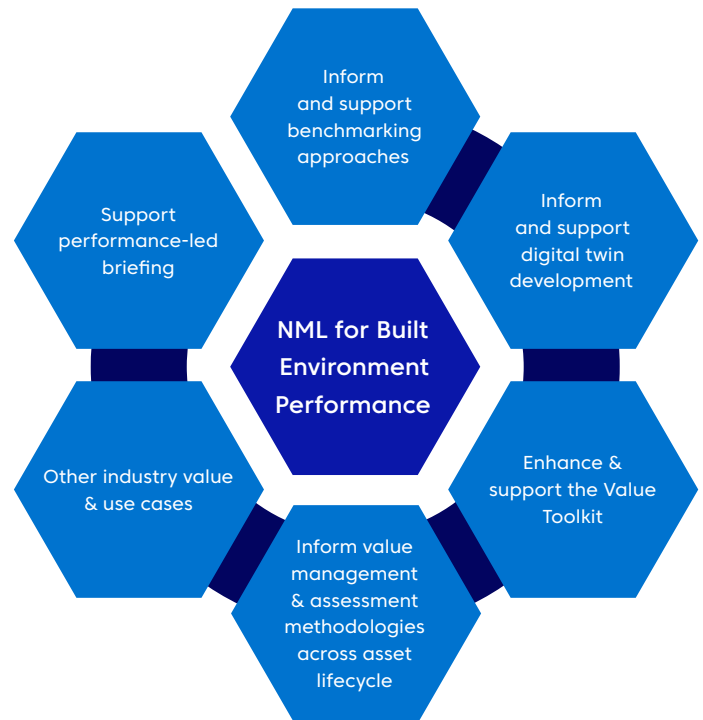


Figure 1. Use cases for the NML

Any solution should seek to provide value to multiple stakeholders within the industry and support its applicability to different value management methodologies across different geographies, sectors, and lifecycle stages.

Key principles

- Open and accessible to all industry and client bodies;
- The NML would be agnostic to any industry methodologies;
- Seek to deliver a digital platform and interface to the NML that would enhance engagement and access and consider access via Application Programming Interfaces (API's); and
- The NML will be a repository for established quantitative and qualitative measurements for performance within the built environment.

1.2 Background

The NML was initially conceptualised by Scottish Futures Trust and the Construction Innovation Hub as a resource for industry and clients. Through this collaboration and the subsequent formation of the CLC Performance Working Group, a sub-group was formed to explore the opportunity and value of the NML.

In July 2021, the NML Working Group was then formed to develop this strategy paper and assess the value and roadmap to implementation.

The group members are listed below:

- Paul Dodd: Scottish Futures Trust (Chair);
- Ellie Jenkins: Akerlof;
- Simon Alderson: Mott McDonald;
- Jeremy Galpin: Costain;
- Tom Jennings: BRE;
- Ian Nicholson: Stantec / Hub;
- Rob Wolfe: CH-Y;
- Charlotte Osterman: Social Value UK;
- James Fiske: RICS; and
- Doug Forbes: Whole Life Consultants.

Recommendation 1: It is recommended that any future implementation plan should involve existing NML Working Group members and that a wider strategic communication plan be developed to raise awareness and engage the wider industry.

1.3 Review of the existing landscape

Early work was undertaken to consider existing systems or solutions within the marketplace that provide similar functionality. The results of this are shown in Appendix B.

One of the platforms researched was the Global Value Exchange (GVE 2.0), established by Social Value UK through multiple streams of grant funding. Its scope was to provide a platform to enable consistency in the measurement of social value. Unfortunately, the platform has been mothballed due to grant funding streams running out. Any future solutions will require articulation of a clear value proposition to users, stakeholders, and sponsors in order to ensure a sustainable model is developed.

Another platform identified is the Built Environment Carbon Database (BECD). The BECD is a collaboration between eleven industry organisations and professional bodies, including RICS, ICE, CIOB, RIBA, CIBSE, IStructE, Carbon Trust, BRE, GBC, WSP & the Environment Agency. The database is envisioned to become the main source of carbon estimating and benchmarking for the UK construction sector and a practical instrument to support the decarbonisation of the built environment. The database is still under development and will enable the collection and supply of product data and entity-level data to the industry through its own portal and by interacting with existing databases and software solutions. The BECD will focus on metrics around embodied carbon within the built environment which is a narrower focus than the proposed NML concept.

1.3 Review of the existing landscape (cont.)

The research identified several systems that contain performance metrics, however, these were focused on specific sectors, themes, or areas of performance. No system was identified which provided a holistic library of performance metrics across the asset lifecycle. The only example identified that sought to deliver this capability was the Whole-Life Performance Framework prototype developed by Scottish Futures Trust.

Additionally, research identified very useful, but sometimes siloed, solutions containing resources for the measurement of our built environment's performance. The opportunity exists for a solution that provides a holistic and overarching repository of performance metrics across the asset lifecycle that could either host metrics or signpost to existing resources, standards, and initiatives in the area of performance metrics.

2. Benefits of the NML

2. Benefits of the NML

The NML Working Group has identified a range of strategic benefits that would arise from a holistic library of performance measurements (as shown in Figure 2), hosted centrally and open to the wider built environment. These strategic benefits include:

- Support new capability in performance-led briefing, delivery and operational monitoring of assets;
- Increase dissemination and knowledge sharing of best practice in relation to performance;
- A resource to support alignment in how we measure performance;
- Efficient approach for the identification, curation and dissemination of best practice in metrics use; and
- Create community and industry resources that support continuous improvement.

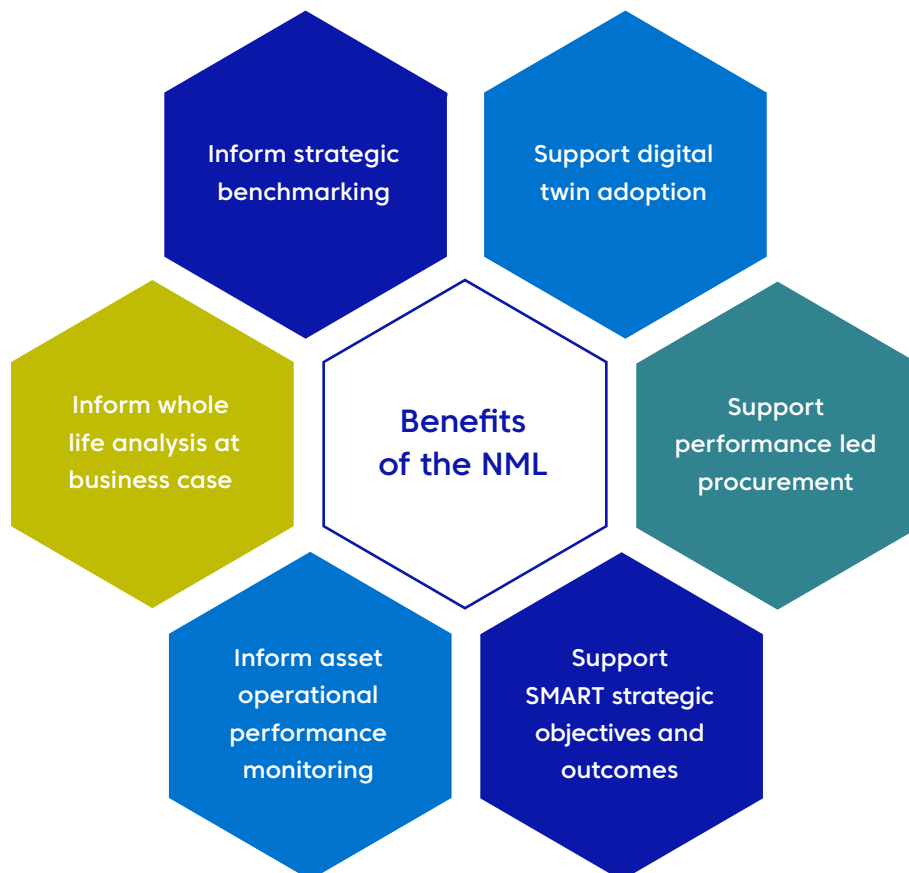


Figure 2. Benefits of the NML

The NML Working Group carried out an analysis of benefits to multiple users as shown in Appendix A the benefits of such a system mapped to the stakeholders' groups are set out in Table 1.

Strategic Benefits	Clients	Advisors	Technology Industry (IoT, Software and Hardware)	Construction Industry (Design and Construction)	FM Industry
Support a new capability in performance-led briefing, delivery, and operational monitoring of our assets	✓	✓	✓	✓	✓
Increase dissemination and knowledge sharing of best practice in relation to performance	✓	✓	✓	✓	✓
A resource to support alignment in how we measure performance	✓	✓	✓	✓	✓
Efficient approach for the identification, curation, and dissemination of best practice in the use of metrics	✓	✓	✓	✓	✓
Create community and industry resources that support continuous improvement	✓	✓	✓	✓	✓
Support innovation in performance management & measurement	✓	✓	✓	✓	✓
Support technology development and economic growth			✓	✓	✓
Support clearer performance-led briefing & risk management to improve outcomes within contracts and delivery	✓	✓	✓	✓	✓

Table 1. Strategic Benefits of the NML

3. Risks to the NML

3. Risks to the NML

In addition to the strategic benefits listed in section 2 above, the NML Working Group has also identified key risks to the development of any solution and associated mitigation measures outlined within Table 2.

The risks to the delivery and sustainable management of any solutions can be managed through the development of a robust business model. In addition, the provision of support to the wider industry and stakeholders on how best to articulate the value to users will further help reduce risks.

Recommendation 2: In the development of an implementation plan, this early research should be tested and if possible a Return on Investment (ROI) analysis developed for the creation of such system, along with consideration of potential disbenefits.

Risk	Likelihood	Impact	Mitigation
The structure of NML does not allow wide integration with other platforms/tools	Low	Medium	Identification and dialogue with potential platform/tool collaborators
Industry adoption is low	Medium	Medium	Wide communications strategy to be developed and implemented to cover all stakeholders
Lack of experts to validate metrics	Medium	High	Use of existing industry groups (e.g., collaborators in BECD)
Lack of sponsor to take NML forward	Low	High	BECD has already stepped forward as preferred sponsor
The commercial model implemented detracts from wider open-source ambition	Low	High	The BECD model allows for open-source access and commercial models for more advanced purposes
Lack of initial input to the library means usefulness is limited	Medium	Medium	Wide communications strategy to be developed to encourage initial input into the library
The process for submitting metrics is complicated and reduces uptake	Low	Medium	Users should be able to leave comments on the process for submitting metrics and regular reviews should be made to ensure the right submission process is in place
Lack of sustainable funding model	Medium	High	Clear articulation of user value linked to sustainable business model
Threat from other initiatives	Medium	Low	Identify and explore opportunities for collaboration

Table 2. High-Level Risk Analysis

4. The Delivery Models for the NML

4. The Delivery Models for the NML

4.1 Baseline Functionality and Scope

NML Vision

“The UK National Metrics Library is a national structured repository of quantitative and qualitative performance metrics for the built environment. It will support coordination, innovation, knowledge sharing and dissemination of best practice to improve how we measure sustainable performance across the asset lifecycle.”

The NML will:

- Be a resource and repository for quantitative and qualitative performance metrics across the built environment;
- Support innovation and knowledge sharing of new and innovative ways to measure value within the performance of our built environment;
- Be open access for all industry and client bodies;
- Be agnostic to any industry methodologies; and
- Provide a direct digital interface that makes the metrics library interoperable / accessible via APIs as illustrated in Figure 3.

The NML will not be:

- Prescribed methodology for value-based decision-making;
- Benchmark database – however it will signpost to known benchmarking sources for the measurement of performance across the asset lifecycle; and
- Method of verifying metrics – however, it will validate the inclusion of a metric by way of ensuring key constituent parts are set out (Description, method of measurement etc).

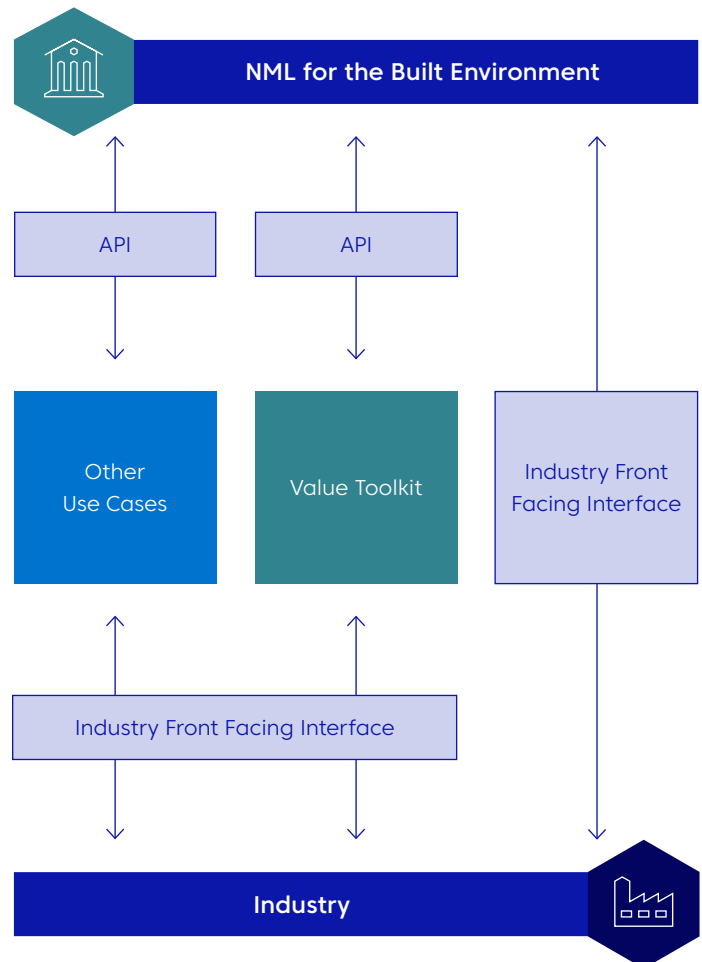


Figure 3. NML Access and Interoperability

4.2 Summary of Delivery Models

The NML Working Group identified three potential delivery models, all of which were considered against key functional requirements as shown in Figure 4.

Option 1	Option 3	Option 2
Community-led Metrics Library	Hybrid	National Approved Metrics Library
Community-managed content	Certify for use / publication	
No Metrics Prioritisation	Prioritisation / Tiering	
No Metrics Grading / Status	Metrics Graded & Status	
High	Encourage Innovation	Low
Low	Resource & Funding	High
Low	Risk & Governance	High
Low	Time	High
Naming Conventions	Searchable Directory / FutureProof	

Figure 4. NML Delivery Model Analysis & Categories

Summary

1. Option 1 — Community-led Metrics Library:

This would be an open-source solution where users can upload metrics and grow the database organically via community-led engagement and minimal management by the host organisation.

2. Option 2 — National Approved Metrics Library:

This option will require a greater level of control by the host organisation where validation and verification will be conducted prior to publication of metrics in the library.

- Option 3 — Hybrid:** A combination of Options 1 and 2 which responds to existing industry development and maturity, whilst encouraging community engagement, contributions, and innovation within this area.

Delivery Model Option 1: Community-led

This would be an open-source solution where users can upload metrics onto a web-based platform and grow the database organically via community-led engagement and minimal management by the host organisation. It would be similar to a ‘Wiki’ website where there is self-management of entries based on reviews by peers using the website. A community-led metrics library would ask for users to register with the site before they could submit to it.

Registered users of the site would submit metrics. To do this, users would need to fill out a blank metric submission page with the metric they wished to submit to the library, the user would have to give the following information about the metric:

- Name;
- Units;
- Publication metric is from and year of publication (if relevant);
- Aligned tool / library / source of metric (if relevant);
- A description of the metric;
- Sector it is used in (if relevant); and
- Any additional commentary on its use.

The list above is illustrative and subject to further development of the solution. Once this has been loaded up onto the site the entry would be open for review and comments from other registered users of the platform.

Delivery Model Option 2: National Approved

This option would build on Option 1 with the addition of a greater level of control by the host organisation where validation and verification prior to publication of metrics in the library will be conducted. Registered users would fill out a blank metric library reference page with the metric they wished to submit. Once this has been loaded onto a back-end of the site, the entry would be reviewed and verified by dedicated reviewers before approval, ensuring that all submissions meet the site's quality of information standards. These standards could include:

- Metric submission pages must be completed in full by users;
- Metric submission is unique and does not duplicate any metrics that are already recorded in the NML;
- Metric has been tested on existing projects; and
- Metric can be freely used under creative commons licencing.

If the submitted metric is deemed to meet the platform standards it would be published in the metric library.

Delivery Model Option 3: Hybrid

This option would respond to existing industry development and maturity, whilst encouraging community engagement, contributions, and innovation within this area. The Hybrid option would be a combination of Options 1 and 2 with a metric library that would try to engage and grow a community of registered users.

Reviews would be conducted using a combination of the community and reviewers to validate and verify submissions. Users wishing to submit a metric would do so by completing a blank metric submission page with the metric they wished to submit to the library. Once uploaded to the site other registered users of the platform would be invited to peer review or validate the metrics. However, if submitted metrics received negative reviews or questions of validity they would be removed from the front end of the platform and reviewed further, by dedicated reviewers, to ensure that a satisfactory level of metric standard was maintained.

Recommendation 3: Through the development of the NML, further analysis of associated criteria should be developed to identify preferred and or hybrid options and consideration made to a phased approach to implementation.

4.3 Comparison of Delivery Models

Through the work of the group to date, several variables have been identified as to the scope and functionality of the NML. This includes how metrics are graded, status and classification as well as the validation required to include a metric within any library. The three emerging delivery models summarised in section 4.2 have been compared for their scope and functionality as illustrated in Figure 4.

Criteria for Model Comparison

- 1. Community Managed Vs. Certification:** Option 1 would be community-led which would be managed by the community and could provide an environment for new ideas and innovation. Option 2 would provide a validation and certification process for the approval of metrics submitted.
- 2. Metric Prioritisation:** Option 1 would not provide any prioritisation of metrics in terms of use or value for the measurement. Option 2 would provide indicators on the value and level of adoption.
- 3. Metric Grading and Status:** Option 1 would not provide any grading of metrics in terms of use or status. Option 2 which would provide indicators as to grading, maturity and/or status.
- 4. Encourage Innovation:** Option 1 would facilitate greater innovation and new ideas for the measurement of performance. Option 2 would create more barriers to the dissemination / sharing of new and evolving metrics.
- 5. Resource and Funding:** Where Option 2 requires a greater level of validation, it would also require greater resources and in turn also a greater level of funding.
- 6. Risk and Governance:** It was felt Option 1 had the lower level of risk as metrics were community-led versus where metrics are validated an increased level of risk would be attracted.
- 7. Time:** It was the belief of the group that Option 1 could be delivered in a shorter time frame due to reduced risk and funding requirements.
- 8. Naming / Metric Directory:** The information data structure for a metrics library should be the same across all options and should provide flexibility to accommodate future metrics, aligning to wider industry naming conventions where practical.

4.4 Functional Requirements for the NML Platform

It was agreed that a digital platform would be required as part of the finalised NML to ensure that the library can be accessed, managed efficiently, and disseminated to the wider industry. The group also considered the approach to any digital platform and three approaches were identified:

1. New Build Platform: This option would require a newly built system and naming convention to be created for the NML.

2. Adopt Existing Metric Platform: This option would involve the strategic collaboration with an existing system and organisation to adopt an existing platform that can be scaled to encompass future whole-life metrics.

3. Adopt & Amend Existing Metric Platform: This option would involve strategic collaboration with an existing system and organisation. It would also require further development work in order to achieve the aligned ambition.

The core functionality of any online platform would include:

- A search function for metrics by metric reference, metric name, words in descriptions of metrics and by the units that a metric is measured in;
- The option to sign up to the NML as registered users; and
- Allowing registered users to be able to leave comments and ratings for metrics on the NML.

The initial proposal for associated data and meta data categorisation for each metric includes:

- NML reference for metric;
- Name of metric;
- Short description of metric;
- Potential use cases;
- Unit the metric is measured in (e.g. kg);
- NML user reviews of metric and its uses;
- A metric rating (based on user reviews, scale TBC); and
- Case studies illustrating the use of metrics on different projects.

The NML would be provided to users using an online interface. This would include a home page with updates on the development of NML and links to the main areas of the NML for users to navigate. These would include:

- An 'about the NML' page;
- A page about the NML sponsors / collaborators;
- A metric search page; and
- A metric case studies page.

4.5 Project Sponsor & Governance

This strategy paper presents a considered assessment of the benefits, risks, and possible delivery models for a future NML based on an initial period of research and industry engagement. This work is deemed as the first phase in the journey toward the launch and management of any future NML solution.

To progress the delivery and business model, the NML Working Group will be required to address three key strategic decisions:

1. Who will be the sponsor/host organisations for a future NML?
2. What will be the governance arrangements for future delivery?
3. What resources & funding can be made available for business case development?

Agreement must be sought on the three strategic decision points listed above in order to progress the project to the next phase.

Recommendation 4: Once the finalised model for delivery and project sponsors are confirmed, a functional specification for the platform will need to be developed, along with an agreement on an approach to platform development.

5. Recommendations

5. Recommendations

Through the work delivered to date, there are key strategic decisions to be made to progress the development of the NML and subsequent recommendations for the implementation, these have been summarised below.

5.1 Strategic Decision Points

The NML Working Group has considered the three key decisions set out in 4.5 and would recommend the following:

1. Who will be the sponsor/host organisations for a future NML?

This strategy for implementation will require recognised and committed leadership to support the implementation of a NML in a collaborative manner with Industry. RICS have played an intrinsic role to date in the development of this NML strategy paper and have expressed an interest in leading this work going forward in collaboration with industry. The RICS has provided a high-level roadmap demonstrating the delivery steps and possible timescales in Appendix C. Due to RICS industry role and its experience in developing the BECD, this provides an existing and established network of collaborative partners. As the professional body of measurement rules and standards in the built environment it is recommended that RICS are asked to lead the development of the NML.

2. What will be the governance arrangements for future delivery?

RICS have set out the steps needed to develop a collaborative working arrangement, using professional bodies as a core steering group. The existing NML working group would become an advisory group, to ensure collective leadership and development of the NML. RICS are actively investigating the participation of the professional bodies who are involved in BECD.

3. What resources & funding can be made available for the implementation plan?

Once levels of commitment are understood from the other participants, the steering group would develop a detailed implementation plan that will define the activities and resource required. Once this is understood, discussions on resources and funding sources will then begin.

Recommendation 5: The onward development and delivery of the NML should be undertaken in a collaborative manner with Industry. The group should take the position of leading the initiative with the support of a wider steering group (including BCIS who are the delivery partner for BECD). develop a detailed implementation plan and put in place appropriate governance and resources to enable the effective implementation of the UK NML that will deliver the impact and outcomes set out within this Strategy for Implementation.

5.2 Delivery

Recommendations Summary

Upon establishing conclusions to the decisions outlined within 5.1 and reaching an agreement to progress to an Implementation Plan for a UK NML, a list of recommendations is offered in connection with the implementation and delivery of any solution.

List of Recommendations

1. It is recommended that any future implementation plan should involve existing NML Working Group members and that a wider strategic communication plan be developed to raise awareness and engage the wider industry.
2. In the development of a business case, this early research should be tested and where possible a Return on Investment (ROI) analysis developed for the creation of such a system, along with consideration of potential disbenefits.
3. Through the development of the NML, further analysis of associated criteria should be developed to identify preferred and/or hybrid options and consideration made to a phased approach to implementation.
4. Once the finalised model for delivery and project sponsors are confirmed, a functional specification for the platform will need to be developed, along with an agreement on an approach to platform development.
5. The onward development and delivery of the NML should be undertaken in a collaborative manner with Industry. The RICS/BCIS should lead the delivery and develop a detailed implementation plan and put in place appropriate governance and resources to enable the effective implementation of the UK NML that will deliver the impact and outcomes set out within this Strategy for Implementation.

Appendix

Appendix A: Review of Similar Initiatives

Name	Link	Comments / Background	Initiative / Metrics / Methodology
International Construction Measurement Standards (ICMS)	international-construction-measurement-standards-2nd-edition-rics.pdf	<p>International Construction Measurement Standards aims to provide global consistency in classifying, defining, measuring, recording, analysing, presenting, and comparing entire lifecycle costs of construction projects at regional, state, national or international levels. ICMS are a high-level cost classification system. The globalisation of the construction business has only increased the need to make this meaningful comparative analysis between countries, not least by international organisations such as the World Bank Group, the International Monetary Fund, various regional development banks, non-governmental organisations and the United Nations</p> <p>ICMS 3 - has recently been developed by 49 globally prominent organisations. For the first time it will allow organisations to deliver a globally consistent method for carbon life cycle reporting across construction projects</p>	Initiative
Built Environment Carbon Database	Built Environment Carbon Database (becd.co.uk)	The database is envisioned to become the main source of carbon estimating and benchmarking for the UK construction sector and a practical instrument to support the decarbonisation of the built environment. The database will be developed to collect and supply product data and entity level data to the industry through its own portal and by interacting with existing databases and software solutions	Initiative
TIES Living Lab (Transport Infrastructure Efficiency Strategy)	Home - TIES Living Lab	<p>Data tools</p> <ul style="list-style-type: none"> • Developing a centralised repository for benchmarking; • Using AI for data mining to facilitate data analysis; • Providing strategic insight into what can improve performance in projects • Digital demonstrators; • An Intelligent Infrastructure Control Centre to provide the; latest, greenest, safest & most cost-effective way to design, deliver or operate transport infrastructure projects • Assisting the smart planning of advanced offsite logistics; • Measuring the social value derived from transport infrastructure projects. 	Initiative
BUILD UPON ²	Build Upon² - UKGBC - UK Green Building Council	BUILD UPON ² is working with cities and councils across Europe to develop a framework for measuring the environmental, social & economic impacts of building retrofit. The framework defines a suite of measurable indicators – carbon emissions, energy consumption, fuel poverty, indoor health, jobs and others – that can be measured in a simple, standardised way at either a city or project level. By capturing this data in a consistent way, the framework will link building renovation to local and national policy and decision-making processes. It also helps build the business case for retrofit, with a view to driving greater investment in city retrofit and regeneration programmes	Initiative

Name	Link	Comments / Background	Initiative / Metrics / Methodology
Scottish Futures	Whole Life Appraisal Tool - BIM Level 2 Guidance	The appraisal tool provides a consistent method of comparing and reporting whole-life outcomes for a new project. It is both a qualitative and quantitative process that looks at the costs and outcomes during the design, construction, operation, and disposal stages for a built asset. The appraisal tool promotes the analysis of whole-life outcomes across three assessment criteria: commercial, performance and environmental	Initiative
Value Toolkit Metrics	n/a	List of metrics for use as part of the value toolkit process for measuring outcomes	Library of metrics (not publicly available yet)
National Infrastructure Commission	Technical-annex-Measuring-infrastructure-performance.pdf	The Commission created a framework to assess the quality of the UK's infrastructure services. The measures in the framework work across most sectors, allowing the Commission to compare different infrastructure systems. They have also been designed to measure the performance of infrastructure against the Commission's objectives	Library of metrics
The Digital National Register	The Digital National Asset Register (d-NAR) Beta - Digital Marketplace	d-NAR will be a cloud-based system to collect, manage and analyse this data to provide insight on the public estate to organisations, cross-public sector programmes, Parliament and the public, leading to greater public transparency. Additional analytical capability will also support better decision making for strategic real estate	Library of metrics (focus on government assets - still in development)
Circular Construction in Regenerative Cities (CIRCulT)	Circular Economy Built Environment Circuit (circuit-project.eu)	The project aims to bridge the implementation gap between theory, practice and policy and showcase how circular construction approaches can be scaled and replicated across Europe, to support the creation of regenerative cities One output of the research programme was to develop standard indicators at the level of materials, buildings and cities	Library of metrics (focus on CE in urban built environment)
Global Value Exchange (GVE 2.0)	Global Value Exchange (GVE 2.0)	The Global Value Exchange enables users to search the database of social value outcomes by keyword (sector, issue, etc.). It lists common indicators that can help to measure social value outcomes and their source	Library of metrics (social value focus) - Currently unavailable
Social Value Model Reference Table	Social-Value-Model-Quick-Reference-Table-Edn-1.1-3-Dec-20.pdf (publishing.service.gov.uk)	This quick reference table contains only the Model Evaluation Question, Model Award Criteria, Model Response Guidance and Reporting Metrics for each policy outcome	List of metrics (social value focus)
CLC Smart Construction Dashboard	New CLC Smart Construction Dashboard Published » Construction Leadership Council	The Construction Leadership Council Smart Construction Dashboard demonstrates housing sector performance using a set of agreed KPI's and benchmarks. The dashboard contains maturity metrics for cost, digitisation, waste, energy, productivity (pre-manufactured value), carbon, health, safety and speed of build, and wellbeing. Along with each metric, there is a progress box containing a circle with a number in the middle. The number in the middle of the circle represents the % change between the 2019 benchmark figure and the 2018 benchmark figure	List of metrics (construction focus)

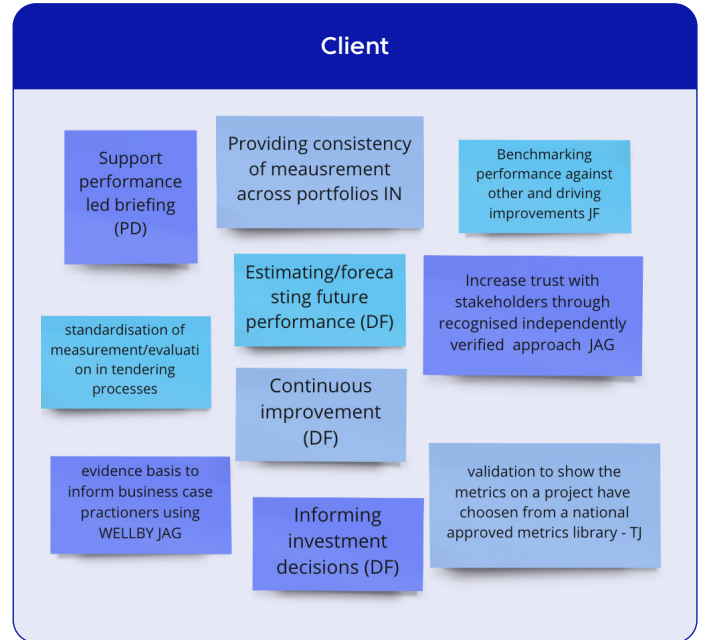
Name	Link	Comments / Background	Initiative / Metrics / Methodology
AIMCH	Microsoft Word - AIMCH - Productivity mapping and literature review - Final version.docx	<p>The AIMCH project aims to help tackle the UK housing crisis by using industrialised offsite solutions to deliver high quality homes faster, more reliably and at the same cost as masonry-built homes. The aim of the literature review is to help the AIMCH partners to understand the current landscape of productivity metrics and future trends, and to enable them to gain a good understanding of key tools and techniques in all areas of monitoring. The outputs will be used to inform and influence the way in which the partners choose to measure their on-site activities</p>	List of metrics (construction focus)
The Performance Framework – construct zero	June Advisory Board update	<p>The Performance Framework has been developed to provide the CLC with a sector-level dashboard on our progress towards Net Zero aimed at motivating businesses to act and to help those outside the sector understand our progress. We intend to collate data for the dashboard on a quarterly basis albeit not every metric will be available quarterly. The data itself will be drawn from sources which already aggregate it, known as ‘data point owners’. In developing the sector-level dashboard we have identified Project and Business Metrics which align to the sector level indicators</p>	List of metrics (construction focus)

Appendix B: NML Workshop Summary

What is the use case for these stakeholders to use the NML?

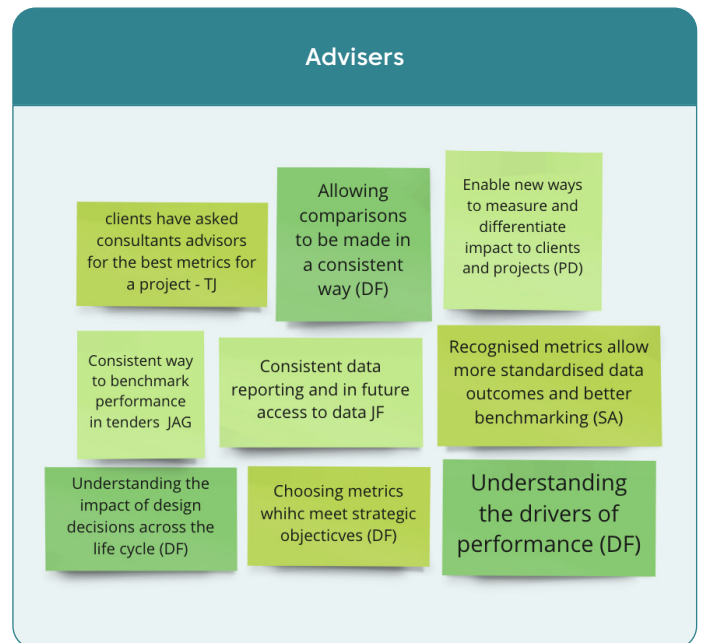
Client: Overall themes

1. Performance forecasting, continuous improvement.
2. Validation and consistent measurements.
3. Business case and benchmarking.

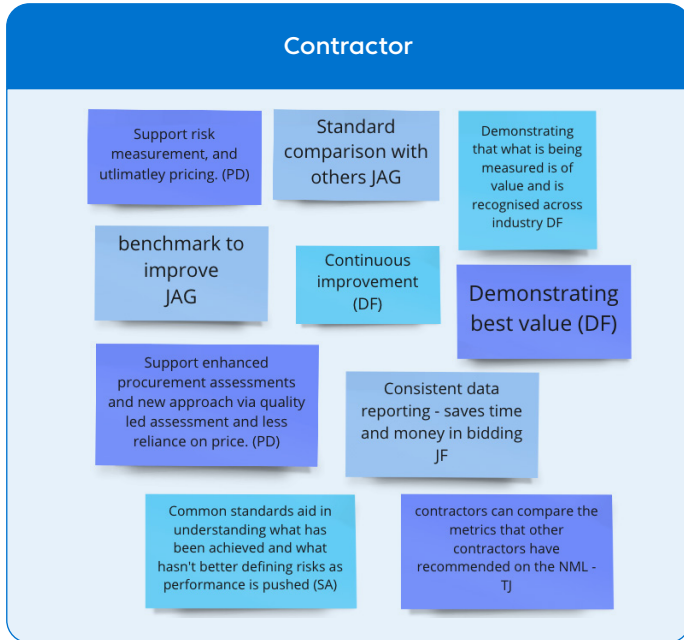


Advisers: Overall themes

1. Understanding impacts, best metrics for project.
2. Consistency, benchmarking, and comparison.



What is the use case for these stakeholders to use the NML? (cont.)



Contractor: Overall themes

1. Risk and pricing.
2. Comparison with other contractors.
3. Demonstrating best value in procurement.



Facilities management: Overall themes

1. Common metrics, understanding performance of existing asset.
2. Dealing with a change of requirements or building ownership for monitoring.

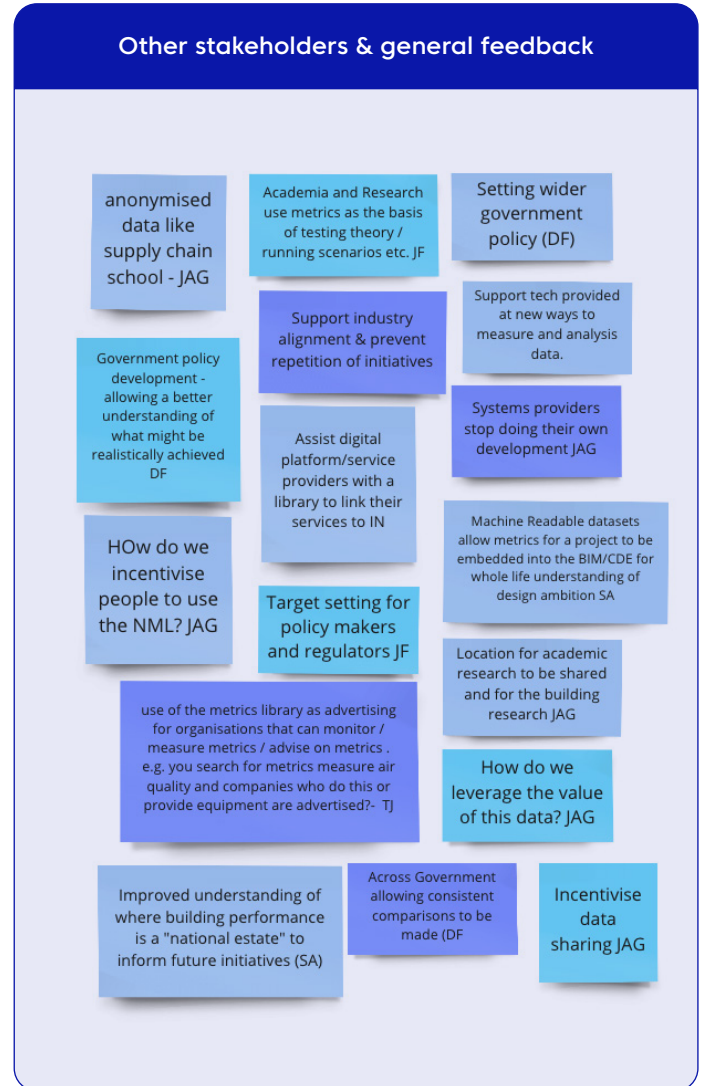
What is the use case for these stakeholders to use the NML? (cont.)

Other stakeholders: Overall themes

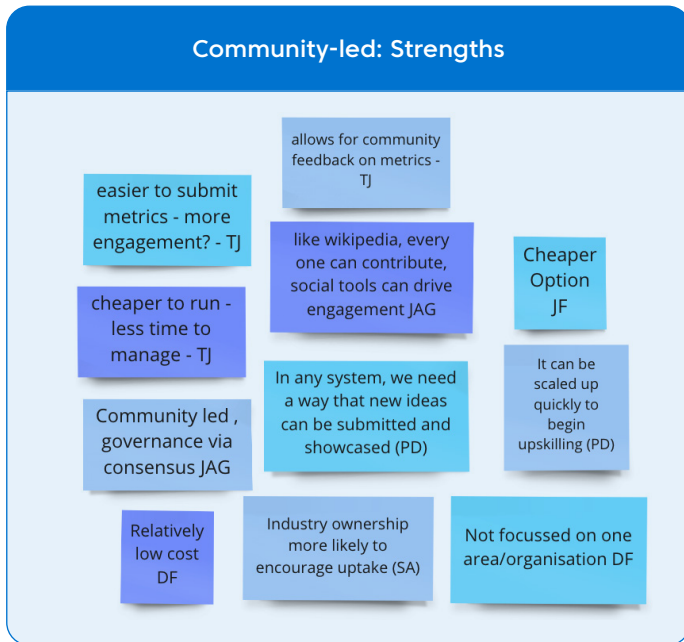
1. Government, national estate, and policy targets.
2. Academic research.

General feedback: Overall themes

1. Avoid repetition and support industry.
2. Incentivising use of NML.
3. Machine readable datasets and BIM.

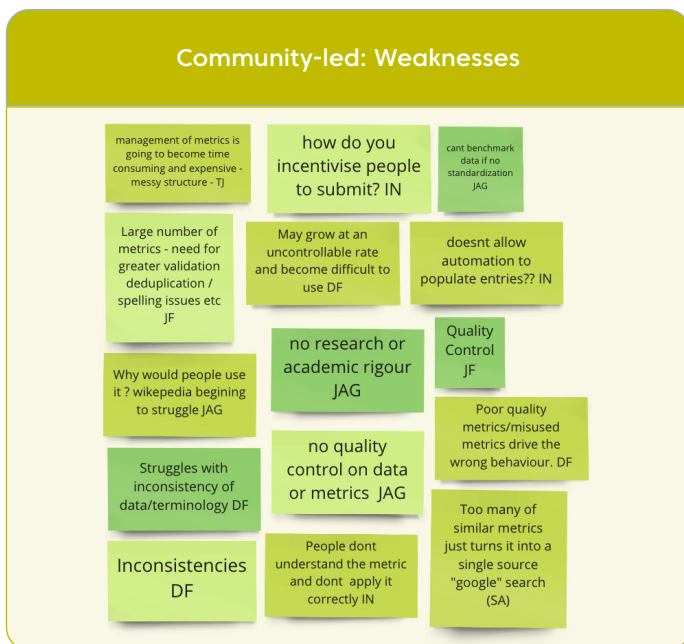


Community-led



Strengths

1. Cheaper to run.
2. Easier to encourage uptake.
3. Scale-up quickly and community feedback.
4. Not focused on one area or organisation.



Weaknesses

1. Inconsistent and poor quality control.
2. Difficult to manage.

Community-led (cont.)

Opportunities

1. Cutting-edge and new metrics, stimulation of ideas.
2. Global participation / wider grass roots participation.



Threats

1. Dependence on industry uptake / risk of lack of uptake.
2. Governance management issues.
3. Lack of assurance of metrics / risks of poor metrics and lack of confidence in them.



National Approved



Strengths

1. Quality control of metrics, greater standardisation.
2. Better participation.
3. Greater linkage to other systems, benchmarking.



Weaknesses

1. Would lead to less creativity and innovation.
2. Higher cost.
3. Complex governance issues.

National Approved (cont.)

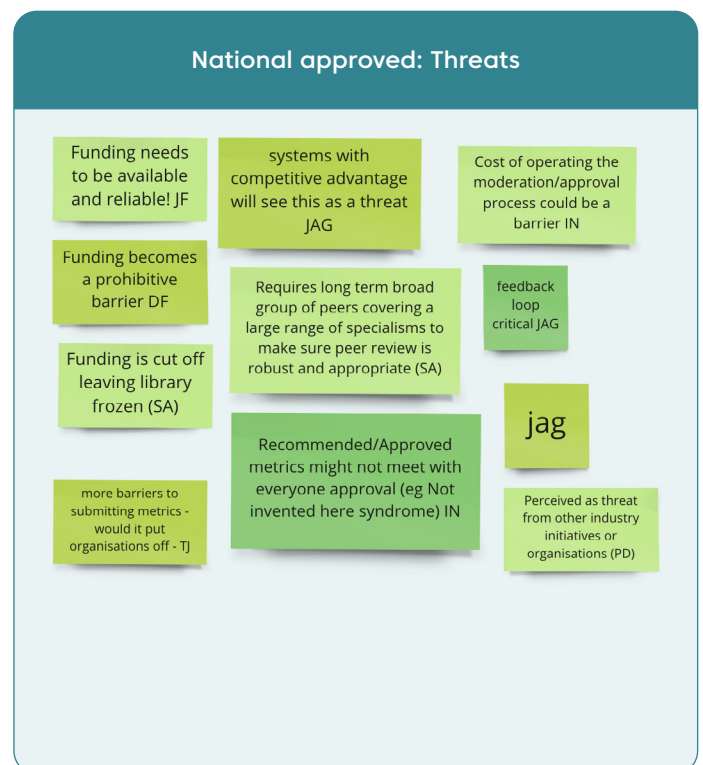
Opportunities

1. Better promotion and adoption of NML due to more confidence in data.
2. More benchmarking / standards, drive up performance.
3. Better management of NML.

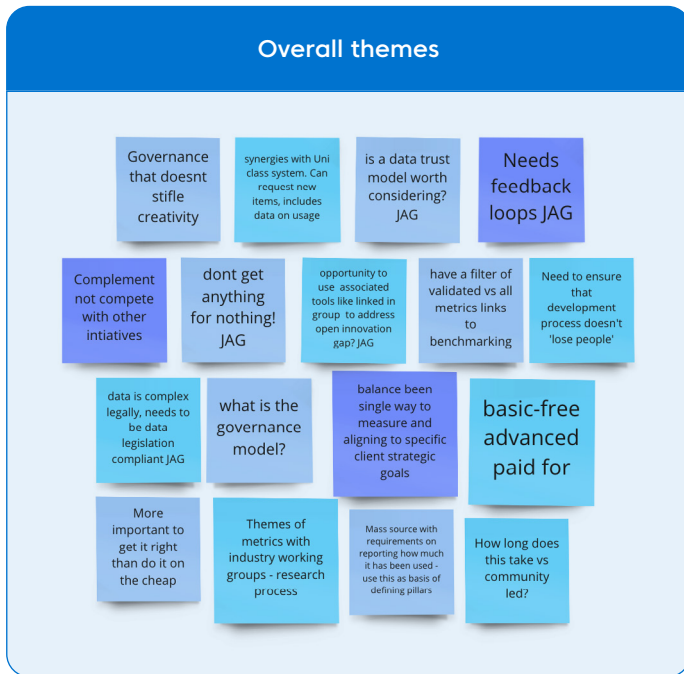


Threats

1. Barriers to submitting metrics and reviewing them.
2. Lack of long-term funding.
3. Perceived threat from other initiatives of a similar nature.



Hybrid: What do you need to calibrate between the two for the right balance?



Overall themes

1. Need to not compete with other initiatives, rather compliment them.
2. Have a good governance structure in place.
3. Have the right associated tools (LinkedIn), data trust as well.
4. Time and cost considerations.
5. Metric themes need to be established.



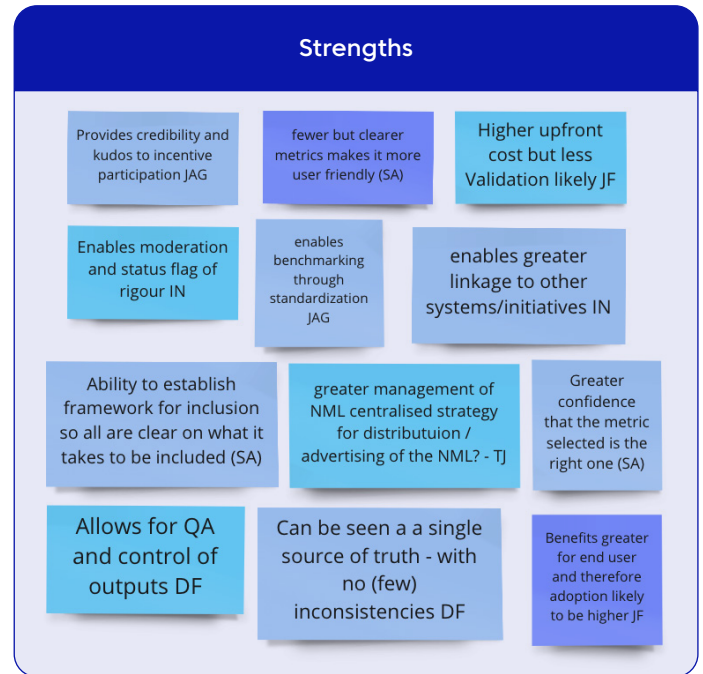
Opportunities

1. Rigorous and robust metrics, benchmarking, and standardisation.
2. Centralised evolution of NML easier future management.
3. Industry engagement and industry improvement.
4. Academic involvement and grants.

Hybrid

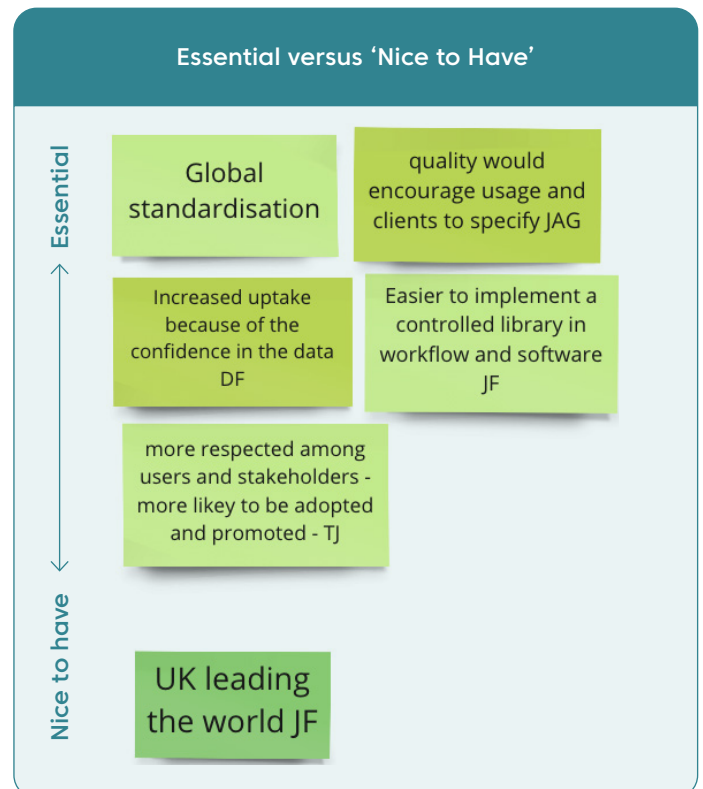
Strengths

1. Single source of truth, QA and credibility.
2. Less validation but higher cost.
3. Greater linkage with other systems, more user friendly, greater adoption by industry.



Essential characteristics of NML

1. Standardisation.
2. Quality.



Appendix C: NML Concept Discussion Paper

NML Discussion Paper

Author: James Fiske • Date: June 2022

What and why?

We need to measure things to benchmark, learn and improve performance in the built environment. Some of the types of things we would like to measure in the built environment are listed in Figure 5 below:

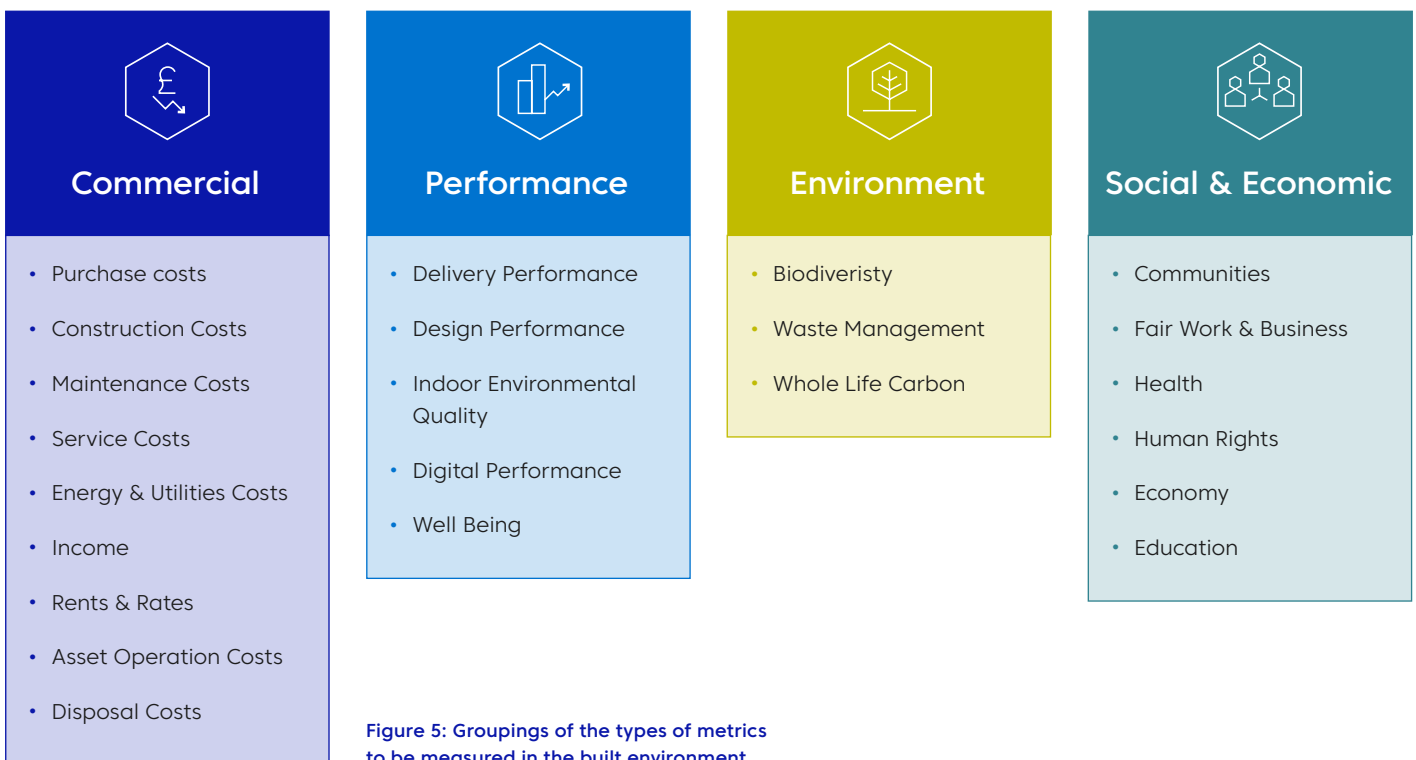


Figure 5: Groupings of the types of metrics to be measured in the built environment

The issue is that some of these things that we want to benchmark have rules on what and how to measure them, others do not.

So the challenge we face in the industry is summed up by the fact that we don't know what good looks like. Hopefully we all want to improve, but we do not know what to measure, how to measure it, or have access to a set of data to identify how we compare against others and what we can improve upon.

The concept of the NML is therefore a place where you can identify things you can measure to assess current performance levels, along with details on how to measure them – and at some point in the future a rich set of data from organisations to help you benchmark against.

How do we achieve this?

There are always different approaches that can be adopted as indicated in the NML Working Group's recent paper. Each has risks and associated timescales. Our proposal for the steps that need to be undertaken is below – based on experience and using the existing network of the Built Environment Carbon Database which is a similar pan industry initiative.

- 1 Set up a steering group and advisory group.** Set up a group of organisations that can drive the change we need – this should come from the professional bodies who dictate the standards for professionals within their field. Proposal: Our current group would become the advisory group.
- 2 Set up working groups.** Set up industry working groups for each metric pillar made up of a cross representation of industry. Each group would go out to the industry on their particular area in order to learn more about what is measured and how. The working groups would then assemble a list with associated methods of measurement and take this out to industry consultation to get to a single definitive list for each pillar. The working groups would do this on a volunteer basis, in return for profile.
- 3 Get support from client organisations and other stakeholders.** Explaining the benefits of driving improvement and how the NML will help them, get clients and funding organisations to support the effort through public endorsement.
- 4 Regular industry consultation and engagement.** Keep NML at the forefront of people's minds with regular consultation – have them asking for development updates – build anticipation – make them feel that they own it. Build a web presence – encourage people to register interest. Update the content. This will be the eventual home of the outputs.
- 5 Release the test version with populated pillars.** Get some early adopters to trial – write case studies to help further adoption.
- 6 Create a self-assessment tool.** See how you rate yourself in performance measurement and improvement – e.g. obtain a score out of 100. With a view to providing benchmarking facilities in the future – start to get organisations to store their data as part of the self-assessment.

The next step is optional but recommended as a way of the NML becoming self-sustaining.
- 7 Full benchmarking facility.** Use the data captured to provide organisations with the ability to compare data against industry peers.

When could we achieve this?

Estimated Timescales Only	MONTH																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Preparation of material																	
Set up Steering Group																	
Set up Working Groups																	
Marketing																	
Get support from industry																	
Tech Development																	
Marketing																	
Industry Consultation																	
Tech Development																	
Marketing																	
Release Phase 1																	

Next steps

Production of materials that demonstrate the importance of the NML to the professional bodies and their memberships.

The Construction Innovation Hub was funded
by UK Research and Innovation



The Construction Innovation Hub was a partnership between:



constructioninnovationhub.org.uk
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