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REDEFINING COLLABORATION ON UK ROADS IMPROVEMENT, A LARGE MULTI-D PROJECT PORTFOLIO

Global Reach

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ABSTRACT

Road investment strategy (RIS) is a strategic project portfolio for ATKINS, member of SNC LAVALIN Group, which includes 10 projects across three packages with construction cost of GBP 1.5 Billion. Atkins' design scope includes optioneering, assessment, design development, DCO application and design to construction with duration of over 5 years. Atkins in Bengaluru is collaborating with multiple UK offices since 2016 and is considered a key partner of success in the delivery of design involving multidisciplinary teams across Global offices. ATKINS India staff are playing global lead roles across various disciplines such as PMO, Highways, Information Management and Structures, as well as by managing global teams. ATKINS staff are collaborating with around 1000 global staff across 7+ offices of Atkins and with the client offices of Highways England in UK.

Proactively driving continuous improvement through development of robust process maps and automated tools has led to achieve consistency across portfolio of projects and meeting timely delivery within agreed costs and up to the right quality. Providing simplified and efficient solutions that enable project managers across global offices to meet delivery requirements and exceed client expectations. Proactively helping the projects to meet and exceed incentive-linked performance requirements from the Highways England and thereby enabling ATKINS to become the preferred supplier and win more work on next stages of design and new schemes.

Digital solutions using analytics and Robotic Process Automation is being implemented on integrated project controls management and 3D design modelling.

INTRODUCTION

This is a new age of digital transformation and globalisation where the world is shirking, time zone differences are considered as boon, behaviours and cultures are being adapted by each other across the globe and collaboration has become necessity to meet and exceed customer expectations and deliver a product which is of right quality, safe by design, economically viable and environmental friendly. At SNC Lavalin, collaboration is one of the core values for each of the employee and at Atkins, India, member of SNC Lavalin Group, collaboration has become a mantra which is enabling the staff from being a task-based support member on small scale of projects to become equal partners of success on complex projects, programmes and portfolios by bringing value not only to internal businesses but also to the lead business organisations and to the end clients.

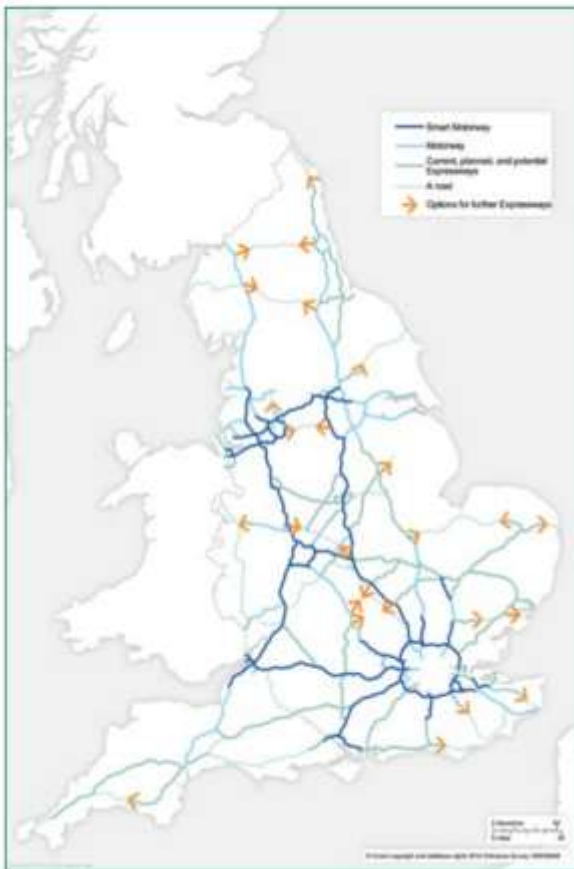
This paper outlines how ATKINS India has made transformation in the digital age where leads and team members have outgrown in delivering from projects to programmes, from programmes to portfolio of major projects from the bygone era where lead offices used to think twice in offloading work to global teams, often with series of questions on their mind such as follows: (i) will this work?, (ii) do these staff have desired skills to execute?, (iii) do they have

apt behavioural skills?, (iv) will there be any cultural differences resulting in conflicts?, (v) how to deal with time zone differences?, (vi) what if the deadline demands peak working during late hours of local time zone? etc. At ATKINS, Road investment scheme (RIS) portfolio of major projects has created a new chapter in collaboration making global teams work as one team and has opened avenues of growth opportunities for not only to businesses but also to the staff.

DETAILS OF THE PAPER

1. BACKGROUND

Highways England is the government-owned company charged with operating, maintaining and improving England's motorways and major A roads. Through first Road Investment Strategy (RIS), DoT, UK Ref [1] are aiming for:



- Providing certainty, with over £15 billion to be invested in UK major roads from 2015/16 – 2020/21
- Increasing capacity, with projects that will deliver over 1,300 additional lane miles
- Improving the condition of the network, including resurfacing 80% of the SRN
- Enabling construction and creating jobs, with almost £5 billion invested in 50 schemes that will help connect housing sites, enterprise zones and other industrial developments.
- £3.5 billion on 20 new schemes that will address some of the most long-standing and notorious network hotspots, including building a tunnel at least 1.8 miles long at Stonehenge and dualling the whole of the A303, transforming connectivity to and from the South West
- £3.7 billion on a further 64 schemes across the length and breadth of the country to improve safety, ease congestion, unlock growth and add nine additional Expressways to the SRN. 49 of these are schemes expected to start construction by 2020

Figure.1 The Network towards 2040

By 2040 DoT, UK aspire to a network that will be:

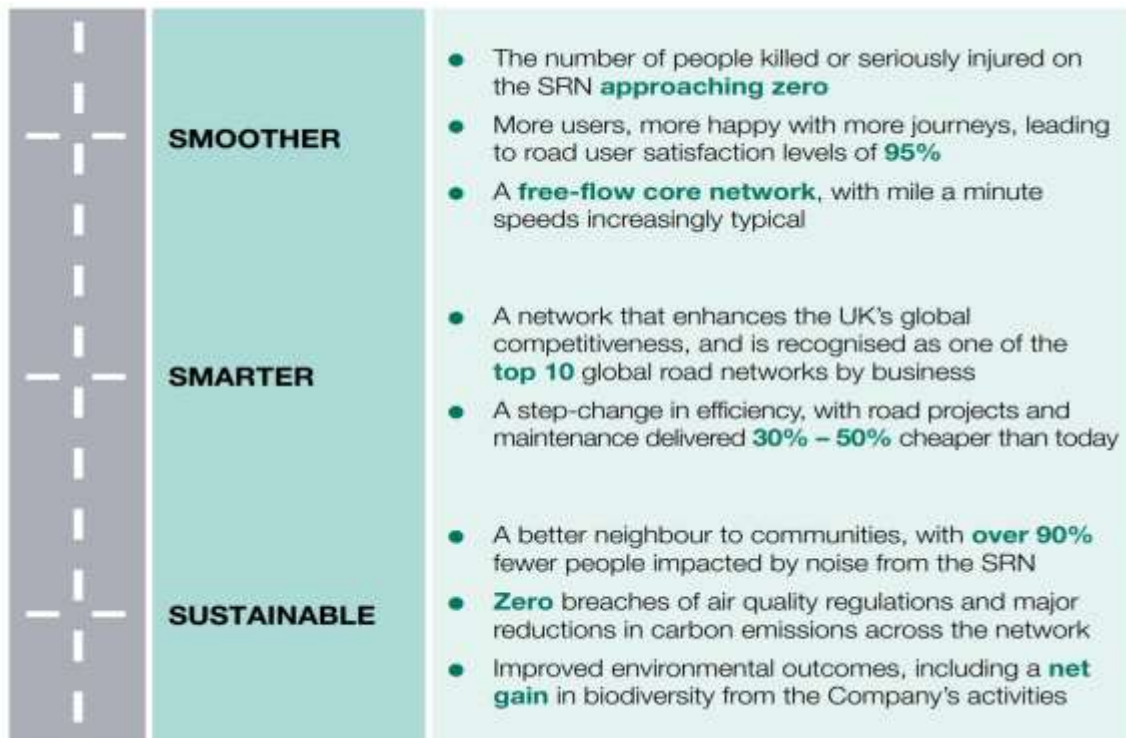


Figure 2. Aspirations of Highway England Ref [2]

1.1. Highway England Project Development—Stages

Delivery of the RIS is planned and streamlined in the following phases and stages to meet the basic principles of the governance requirements in a most efficient manner as shown in Figure 3.

- **Options phase** – identifies the preferred road solution to the transport problem. There is certainty by the end of the phase, for example, the project will involve widening along a specific route.
- **Development phase** – focuses on the design of the preferred solution taking it through the necessary statutory processes up to the point where a decision to commit to invest in building the road solution can be made.
- **Construction phase** – is where the road solution is built, handed over for operation and the project is closed.

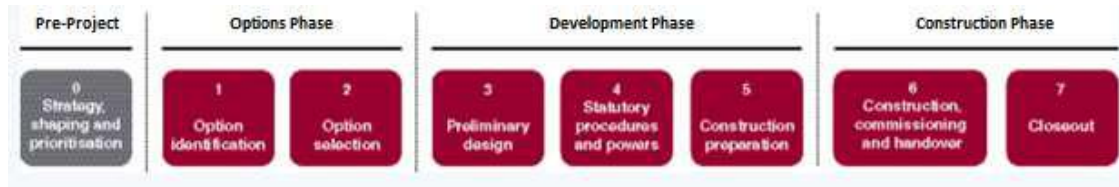


Figure 3. Phases and Stages in Highway Project Development Ref [3]

1.2. THE PROJECT CONTROL FRAMEWORK (PCF)

PCF provides a robust and clearly structured process for the management and delivery of schemes. Highways England review concluded that the application of the PCF should not delay the progress of well managed schemes, but brings the necessary rigour to ensure the schemes achieve their goals and are delivered on time'

The PCF provides a defined lifecycle with a clear start and end point, broken into phases and stages structured around key milestones. Progress is measured by the successful completion of products (which are all based on legal requirements, standards or recognised best practice) with the focus being on the quality of these documents and the outcomes that they are intended to deliver Ref [3].

1.3. COLLABORATIVE DELIVERY FRAMEWORK

Highways England believes that behaviour is so important and considered behavioural assessments with a weightage of 30% when it selected the companies for its Collaborative Delivery Framework (CDF) in 2015. The theory is that by selecting designers, contractors and suppliers who behave in a certain way that they will encourage collaboration, an essential ingredient if new ways of working are to be implemented. The Supplier co-operates with other Suppliers appointed to the framework in obtaining and providing information which they need in connection with work under this framework and share best practices across the framework.

This approach was borne out of the need for the public and private sector to deliver more for less. In RIS it is needed to deliver programmes rather than projects and that means all the partners and parties must work together. Collaboration and behaviour are the key criteria to programme delivery.

Traditionally, the contractor makes submissions to the designer who in turn makes submissions to Highways England, who then considers the submission before accepting or rejecting it. Within CDF, the collaborative approach meant that decisions were considered collectively rather than individually, as against the case with the traditional approval process. All the stake holders like Client, design consultant and contractor are the equal partners in achieving the desired benefits.

Framework members will be measured on their behaviour and their ability to collaborate. Highway England has developed key performance indicators (KPIs) that will be used to measure these aspects under the Collaborative Performance Framework (CPF). If any problems arise they are aired at a bi-monthly meeting.

ATKINS, member of SNC LAVALIN Group, is awarded with the CDF contract to develop RIS schemes Ref [4], [5]. The aim is to Improve the safety, reduce the construction cost and time and give benefits to road users.

2. Road improvement portfolio of projects

Road investment strategy (RIS) is a strategic project portfolio for ATKINS, member of SNC LAVALIN Group, which includes 10 projects across three packages with construction cost of GBP 1.5 Billion. Atkins' design scope includes optioneering, assessment, design development, DCO application and design to construction with duration of over 5 years. Atkins in Bengaluru is collaborating with multiple UK offices since 2016.

PROJECT, PROGRAMME AND PORTFOLIO

Concept of Global reach on a project is different from that of a programme which in turn is different from that of a portfolio of projects. The complexity levels and challenges will multiply from a project to a programme, from programme to a portfolio of projects environment. The teams in a project will need to interact with other teams on a programme and the wider teams on the portfolio. More channels of communication will bring in more complexity if not planned properly. If the team involves multiple disciplines, there interdisciplinary coordination is the key to deliver feasible design. Same teams working on different projects in a programme and that of a portfolio will call for resource loading issues, dealing with them calls for an effective planning, sharing the information across the teams will become complex if the configuration management is not done deftly. Driving consistency will be a challenge if there is no effective collaboration between teams. Global divide will add another dimension to the challenge if there are no mechanisms and tools to drive effective collaboration.

MULTI-D TEAM

RIS is a multi-disciplinary large team involving more than 10 disciplines some of which are Highways, Structures, Drainage, Pavement, Lighting, Environment, PMO etc. At ATKINS, multiple teams are collaborating with global teams and working as single team in delivering integrated design meeting requirements of the triple constraint of scope, time and cost and are delivering right quality design. The sub sections below outline the key areas demonstrating the global reach being achieved on RIS portfolio of projects.

2.1. COMMUNICATION

In RIS, communication is kept open and is shared across project staff through followings tools and methods:

- **Email:** standard mode of communication being used
- **Skype Video:** Skype video calls are done daily across global and inter-offices teams where teams are spread across various offices or floors in a same office.
- **SharePoint:** SharePoint sites are available for any quick clarification on methods, templates and tools.
- **Webinar:** webinars are done at programme and portfolio level to share the information across wider teams.
- **Smartboards for conferences:** Smartboards are being used during inter-office conferences for effective communication.
- **Yammer Group:** Team communication, Knowledge and best practice sharing happens here. This serves as a platform for discussion about the problems and attaining solutions.
- **Stand up Meetings:** Drumbeats/stand-up meetings are done at individual team level.
- **Work plan Meeting:** Scheduling and monitoring the status of all the activities are done.
- **Interdisciplinary Meetings:** This helps in discussion about the technical issues and the concerns of the disciplines and in arriving at the best possible solutions that suits all.
- **Surveys:** Surveys are carried out on regular/ need basis to share and get feedback from all the project staff. On RIS, ATKINS is playing a pivotal role by not only just participating in the surveys but also analysing the survey data and generating reports that need to be shared with key stakeholders for further disseminating the information.
- **Feedbacks:** Regular feedbacks are raised on a systematic way; the area of improvements are identified and the action plans are developed and implemented appropriately.

2.2. INFORMATION MANAGEMENT

Information and technology are the significant business enablers to collaborate in more efficient and effective methods of operating and maintaining. In RIS, the complete information is managed through a Better Information Management (BIM). This ensures the appropriate collaboration and control of information among the stakeholders like designers, technicians, experts, project management team and the leadership team. The early collaboration on designs helps in minimising the design clash and rework time. This helps the project managers and planners to plan the work in a most efficient manner. BIM enables the understanding of the asset before getting built, understanding the problems and creates the opportunity to remove them before proceeding to site and also helps in visualising the assets before they are built.

2.3. COLLABORATION

Collaboration is fundamental to driving significantly improved results, Ref [6]. The Supplier must genuinely share in the Employer's belief in the value of collaboration and be committed and to demonstrably collaborate, by:

- supporting the Agency to develop its collaboration capability maturity in line with industry best practice; and
- supporting, contributing and delivering a significant improvement in project, programme and portfolio management capability

Consider a scenario that Team A in ATKINS asks a query to Team A of Global office, where Team A then approaches Team B of Global office which in turn will approach Team B in ATKINS and the same chain of communication will follow to give the answer to Team A in ATKINS. This may suggest that teams are individually collaborating but not an effective collaboration. At ATKINS this scenario doesn't exist, as the teams are effectively collaborating and ensure that integrated design is achieved by regular interactions and discussions among all multi-disciplinary teams.

The need for collaboration is realized when the limits of abilities, knowledge, resources prevent the individuals and groups from completing a given task and meeting the requirements on their own, or when collaboration can help them complete the task more quickly and efficiently with more value proposition.

Typical project-based organizations may face unique problems and barriers to collaboration. Projects generally comprise a mix of individuals with different job functions, geographies, cultural barriers and highly specialized competencies, all of which make it difficult to establish a common knowledge base and shared understandings.

In RIS following tools and methodologies are adopted.

- Basic functions which include intranet, e-mail, file sharing, and document management and Building Information Management system, audio/video conferencing.
- Fundamental collaborative functions which include interactive workshops, task plans, team calendar and meeting scheduling, project news bulletin dashboards, weekly interactive and interdisciplinary meetings etc.
- Additional collaborative functions, which include surveying/polling and application sharing
- Add-on functions which include site visits and staff secondment.

2.4. TIME ZONE DIFFERENCES

Time zone difference is being used as benefit for the teams to enhance the working time on a given day and thereby enabling teams to meet stringent schedule requirements and there by potentially safeguarding the overall construction schedule.

2.5. ADAPTING LEAN

Lean is a systematic method for minimizing waste and maximising the efficiency. Highways England is committed to the use of Lean in achieving continuous improvement and meet the strategic objectives. Lean principles provide a foundation to enable the key priorities to be achieved, and Lean approach provides the skills and tools that support continuous improvement in the organisation. In RIS schemes, the following Lean techniques are extensively used:

- Visual Management
- Collaborative Planning
- Weekly Work Plan meetings
- 3 C (Concern, Cause & Countermeasures)
- Process Improvement/Automation

2.6. DRIVING CONSISTENCY

The challenge of driving consistency across the portfolio of projects is being addressed through effective collaboration, developing robust processes and tools and regular training of inexperienced staff identified on the project/s. For example, in PMO discipline, multiple process maps covering commercial management plan, performance reporting, document controls and P6 programming were developed that will enable the team working on various projects to adopt the process and deliver consistent reports.

2.7. CONTINUOUS IMPROVEMENT

Continuous improvement is the key to drive efficiencies. To help Highways England to meet their target of GBP1.2 billion efficiency savings over the next road period, all project discipline teams are working on continuous improvement methods to identify efficiency in the process or design (or both) and through lean management initiatives. For example, the Better Information Management team is working on applying Robotic Process Automation (RPA) to develop efficient 3D models. PMO team has developed multiple semi-automated spreadsheet-based tools which are helping in bringing efficiencies and consistency in delivering the reports to Client and further working on applying RPA to generate fully automated robust tools.

2.8. SHARING THE LESSONS LEARNT

At RIS, collaboration happens at portfolio of projects where the lessons learnt are easily disseminated across the teams on regular and timely manner. For example, any feedback from the client on a specific project is shared across all other projects which will help in avoiding similar feedback on other deliverables where applicable. Any change in

the format request on time and expense billing from the client is shared across the project commercial teams which will help in proactively acting and minimizing any delays caused by similar requests from other stakeholders from the client office on other projects.

3. The Success Factors

Following are the Key success factors

- Collaboration is the key to the success in developing robust integrated designs to drive consistency and bring efficiencies.
- Solution mindset: Providing solutions when problem persist and to always keep the big picture in mind.
- Expertise: Demonstrated expertise over years that helped to secure global lead roles on few disciplines.
- Trust gained over a period of time helped to secure and deliver increased work from ATKINS.

4. Benefits to the businesses

Intangible benefits of collaborative working on RIS

- Personal flexibility on time management and availability of resource for maximum time of the day which helps in further compressing the schedule duration.
- Skill enhancement, capability building of the teams, knowledge sharing among the team etc, which indirectly helps for improved team work and team interpersonal relations.
- Lesser attrition rate as the staff get global exposure, challenging work and opportunities to travel globally.

Tangible benefits of collaborative working on RIS

- Increased chance of winning more work from the same client.
- Increased value proposition to business
- Improved Productivity
- Consistently best performing projects among incentive-linked performance criteria contracts.
- Improved quality, minimum wastage and rework

5. Case study on Project management office (PMO)

RIS PMO team supports global Project Managers (PM) and Project Leads (PL) across multiple offices in UK in developing tools and techniques to drive project governance, monitor and control and report project performance to Highways England. It involves following major functions which largely are managed and delivered by project teams in ATKINS, India.

- Commercial Management
- Project Controls Management
- Performance Management
- Document Controls management
- Package Management

Commercial Management involves managing commercial requirements during bid to drive contract agreement and provide support to global PMs in delivering commercial reports to Highways England as per contracts requirements. The teams own the commercial deliverables and liaise with commercial teams in Highways England offices.

Project Controls Management involves developing project delivery plans in collaboration with PMs and PLs, developing tools and techniques on cost management using earned value management for internal governance, provide spent dashboards and EV performance metrics on regular basis. Schedule management covering P6 programmes development during contract agreement and developing integrated schedule by collaborating with global PMs and teams and delivering updated programmes as per contract requirements.

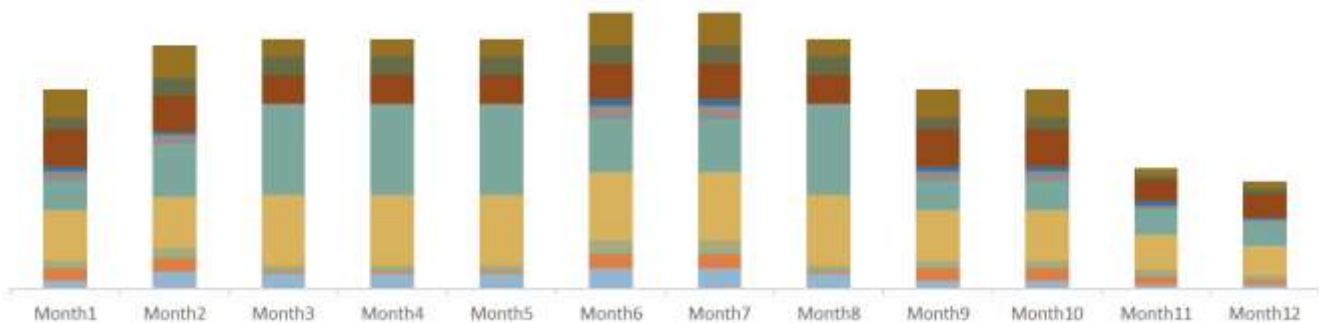
P6 planner collaborates through video conference with multiple discipline leads spread across multiple global offices to gather inputs in developing integrated schedule, thus meeting contract requirements. Once developed and agreed with the client, the P6 Programme will be updated at regular basis by collaborating with all stakeholders, which will be then delivered to the Highways England during each agreed reporting period.

Performance management involves supporting global PMs, performance managers on multiple performance metrics in managing and reporting as per the contract requirements from Highways England.

Document controls management involves developing tools and techniques for effective delivery management support and help PM teams during delivery submissions to Highways England as per contract requirements.

Package management involves managing and governing the work packages from the RIS at ATKINS, India. It involves typically delivery, commercial, resource management and managing risks, issues and changes to the scope agreed with lead offices. This further helps to align, monitor and control the project performance indicators at package level.

Typical Multiple disciplinary resource profile on a single project



PMO team has played instrumental role in driving programme/portfolio level approach on multiple projects in achieving consistency in delivering reports, programmes and submissions. Multiple robust process maps and tools were developed using Excel spreadsheet which has helped to move away from resource dependency to process dependency. Several training modules and on the job learning were provided to the project staff that helped them to develop expertise and grow in the organisation.

CONCLUSION

Collaboration and innovation through continuous improvement techniques plays phenomenal role in enabling the global teams to work as a single team in delivering success on the portfolio of large size and complex projects.

On RIS, the traditional approach of physical presence and face to face way of working got a step change through digital innovation and advanced communication tools that are being implemented on day to day basis to shrink thousands of kilometres of distances across the continents and also, the robust processes and systems are enabling to use global time zone differences as a benefit in achieving successful delivery across portfolio of projects. Continuous improvement with the lean approach and automated tools viz., RPA- Robotic Process Automation, visual management have led to achieve consistency on all deliverables and meeting the time and cost targets with right quality standards.

Providing simplified and efficient task and cost managing solutions are enabling the project managers to efficiently monitor and control the teams 24X7 across multiple global offices. Systematic way of implementing the right cultural behaviours are bridging the gap in understanding the teams with diverse cultures across the borders and driving smooth conflict resolutions. Interdisciplinary coordination calls by bringing in the expert communities are helping in timely resolution of design clashes and provide integrated wholistic design to create safe and sustainable Strategic Road Network.

Proactive efficiency management using Lean, Continuous improvement, driving consistency and sharing lessons learnt are helping the projects and teams to meet and exceed the incentive-linked performance requirements by Highways England and thereby enabling ATKINS to become the preferred supplier and win more work on next stages of design and new schemes.

The RIS experience is enabling step change in performance, collaboration, delivery and growth not only to the businesses but also to every project staff.

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