

Establishment of Centre for Sub-Saharan Transport Leadership

Business Plan



Mott MacDonald, University of Cape Town and University of Birmingham

RAF2147A

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Cover photo: KNUST Interview, April 2019 at KNUST in Kumasi, Ghana

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Abstract

Mott MacDonald, the University of Cape Town and the University of Birmingham commenced the establishment of a Centre for sub-Saharan Transport Leadership (CSSTL) in February 2019. In the period since, an assessment was undertaken on shortlisted universities, leading to Kwame Nkrumah University of Science and Technology (KNUST) being awarded the position of Host Institution for the CSSTL. This deliverable is the Business Plan and outlines the basis on which the CSSTL and the MSc in Transportation Leadership will be developed, managed, funded and monitored.

Key words

Leadership, capacity building, development, training, education, CSSTL, Centre of Excellence, transport engineering, transport services

Research for Community Access Partnership (ReCAP)

Safe and sustainable transport for rural communities

ReCAP is a research programme, funded by UK Aid, with the aim of promoting safe and sustainable transport for rural communities in Africa and Asia. ReCAP comprises the Africa Community Access Partnership (AfCAP) and the Asia Community Access Partnership (AsCAP). These partnerships support knowledge sharing between participating countries in order to enhance the uptake of low cost, proven solutions for rural access that maximise the use of local resources. The ReCAP programme is managed by Cardno Emerging Markets (UK) Ltd.

www.research4cap.org

Acronyms, Units and Currencies

AfCAP	Africa Community Access Partnership
ASANRA	Association of Southern African National Road Agencies
AsCAP	Asia Community Access Partnership
CIHT	Chartered Institution of Highways and Transportation
CoE	Centre of Excellence
CPD	Continuous Professional Development
CSSTL	Centre for Sub-Saharan Transport Leadership
DFID	Department of International Development
GIZ	Gesellschaft für Internationale Zusammenarbeit GmbH (Germany)
HVT	High-Volume Transport (DFID-funded programme)
JBM	Joint Board of Moderators
KNUST	Kwame Nkrumah University of Science and Technology (Ghana)
MDB	Multilateral Development Bank
MoU	Memorandum of Understanding
MSc	Master of Science
NAB	Ghanaian National Accreditation Board
ReCAP	Research for Community Access Partnership
SA	South Africa
SANRAL	South African National Roads Agency Ltd
SSA	Sub-Saharan Africa
TSLDP	Transport Sector Leadership Development Programme (ReCAP)
UCT	University of Cape Town (SA)
UK	United Kingdom (of Great Britain and Northern Ireland)
UKAid	United Kingdom Aid
UoB	University of Birmingham (UK)
WB	World Bank

1 Introduction

1.1 Proposal

This Business Plan is to support the establishment of a Centre for sub-Saharan Transport Leadership (CSSTL) at Kwame Nkrumah University of Science and Technology (KNUST) in Kumasi, Ghana and secure approval from KNUST University Management for the establishment of a new programme at the University.

The Business Plan may also be used to secure support from third parties, such as donor agencies, other universities and industry partners, who could support the CSSTL in terms of funding, training delivery, quality assurance or accreditations which help achieve the CSSTL sustainability goals.

The CSSTL will act as a Centre of Excellence (CoE) for sub-Saharan Africa (SSA) in the field of transport leadership. The CSSTL role will be to develop future generations of confident and competent transport leaders, capable of leading the highway transport industry across the African continent.

The CSSTL will be hosted at KNUST in Ghana under the Transport Research Education Centre Kumasi (TRECK) in the College of Engineering. Whilst based in Ghana, its objective is to target the African region. It is expected that once the MSc becomes established (estimate approx. 4-5 years), approximately 75% of the student intake should be international students from SSA countries other than Ghana.

The CSSTL will achieve its capacity building goal through establishing a training programme consisting of an MSc in Transportation Leadership and Continuous Professional Development (CPD) courses. It is also proposed to establish a coaching programme whereby the candidates receive support from industry Senior Leaders, who can guide them on their future career paths.

The MSc degree will consist of a selection of blended learning modules delivered in blocks of one-week duration at KNUST followed by an examination, with pre and post-work assigned to students to be completed in their home countries. This makes delivery flexible and more amenable to the target candidates, who are experienced professionals balancing this programme with existing employment and family responsibilities.

CPD delivery will consist of candidates attending the one-week module blocks only, without the need for pre or post-work, or examination. Candidates can pick specific modules of interest to them (e.g. leadership development) and attend these. They will receive a CPD certificate that will contribute towards their professional registration training requirements. This method of CPD delivery avoids the need to develop a separate CPD course whilst generating additional revenue for the CSSTL.

1.2 Problem Statement

Transport professionals in SSA deliver transport strategies in a complex environment of financial, political and social challenge. These challenges are combined with wider-societal challenges from increasing populations, urbanisation, threats to the natural environment and a changing climate.

Young transport professionals will become the next generation of senior leadership for the sector. At present there are no capacity building programmes available that holistically develop their technical, managerial and leadership skills and help them to be effective leaders once they ascend into positions of authority.

Evidence suggests that many transport professionals originate from a civil engineering background. However, it is important that professionals have a broad technical skillset, which includes a blend of engineering and transport knowledge, alongside managerial and leadership skills. Specific technical programmes, whether they are in civil engineering or transport fields, do not provide this blend of

learning. As a result, the tertiary education sector is not producing suitably skilled transport professionals in sufficient numbers to eventually lead the sector.

International experts are regularly used to advise and implement projects in SSA. It is widely seen that the age profile of these professionals is increasing, therefore, their continued use is not sustainable. Furthermore, the use of international experts does not appear to be sufficiently benefitting the skills development of African transport professionals. This is likely due to the intermittent and ad hoc nature of the interactions between the international experts and African transport professionals.

Therefore, an effective Africa-driven and Africa-focused training programme is required to bridge this gap and ensure that the transport industry in Africa has the capacity to be driven by high-calibre African transport professionals into the future.

It is important that African transport professionals can be trained and developed from within Africa, based on a curriculum and syllabi that are focused on African transport needs and delivered from an African transport context. This is not necessarily achieved when African transport professionals study in Europe, America and elsewhere. Whilst the European and American programmes are highly recognised, they are tailored towards their local transport sectors and not the environment, culture and society that transport professionals in Africa must operate within.

1.3 Needs Basis

This project is borne out of the Transport Sector Leadership Development Programme (TSLDP), which is run under the Research for Community Access Partnership (ReCAP) funded by UKAid.

The African transport industry is rapidly developing and facing multi-disciplinary transport, financial, political and social challenges which transcends the traditional technical and project management skillsets of most engineers and transport professionals. This project was established based on these concerns, which were raised with ReCAP by the Association of Southern African National Road Agencies (ASANRA).

The TSLDP project was developed to define a way to respond to these known shortfalls in managerial and leadership capacity. The concept was developed into a project by ReCAP and a scoping study was completed in 2017. This study identified the CSSTL and an associated training programme, located at a university in SSA, as being the most sustainable means of progressing.

During the scoping study, a needs assessment was prepared to justify the programme basis and identify focus areas¹. Based on this, it was apparent that transport professionals in SSA get a solid academic foundation in the technical components of civil and transport engineering. However, there is a need for a more widely skilled transport professional who is also a manager and leader.

Results obtained from an online survey of professionals drawn from the civil engineering and transport sectors in SSA revealed that there is a need for a programme specifically tailored towards transport experts on the continent, focused around leadership and management. The programme will provide a solid grounding in technical disciplines where there are obvious knowledge deficiencies – e.g. transport operations, policy and planning etc.

However, where it will differentiate itself from other programmes, is that it will also focus on leadership development. This will focus on areas of personal development, understanding leadership and management skills from a psychological perspective and what is required to lead and develop high-performing teams, create a high-performing environment, lead change in an organisation and manage their own transition from mid-level management to industry or organisational leaders.

¹ ReCAP Rural Access Library: <http://www.research4cap.org/SitePages/Rural%20access%20library.aspx>

1.4 Aims and Objectives

1.4.1 Aims

The aims of this initiative are to:

1. Establish a sustainable CSSTL at KNUST in Kumasi, Ghana under TRECK, which becomes a Centre of Excellence for transport leadership in Africa.
2. Establish an MSc degree in Transportation Leadership that within 5-years of establishment is attracting high-flier candidates from across SSA.
3. Develop a CPD offering based around the MSc modules that can act as further capacity development and an additional revenue stream for the CSSTL.
4. Establish a coaching programme that provides the candidates with career development support from Senior Leaders in the industry.
5. Create a sustainable CSSTL which survives on a cost-recovery basis beyond the end of the ReCAP and High-Volume Transport programmes, which are supported by UKAid.

1.4.2 Objectives

The objectives required to achieve these aims are:

1. A signed agreement between KNUST and ReCAP for the establishment of the CSSTL at KNUST (see Appendix A).
2. Agreed curriculum and syllabus for the MSc degree in Transportation Leadership.
3. Approval from KNUST University Management for the establishment of a new programme within the Transport Research and Education Centre Kumasi (TRECK) Centre of Excellence at KNUST.
4. Accreditation of the programme from the Ghanaian National Accreditation Board (NAB) for the MSc in Transportation Leadership.
5. International accreditation from a recognised professional body, such as the Engineering Council in the UK. This will likely follow in one or two years after implementation of the MSc as the accreditors will want to assess programme outputs/graduates before accrediting.
6. Marketing TSLDP and CSSTL at regional and international conferences to generate interest from potential students.
7. Applications portal for the MSc to open in January 2020.
8. Applications to close in July 2020 with the first cohort commencing in September 2020.
9. A second cohort to follow shortly after in January 2021.
10. Monitor and evaluate implementation and utilise the feedback to continuously improve delivery.

2 Operational Structure

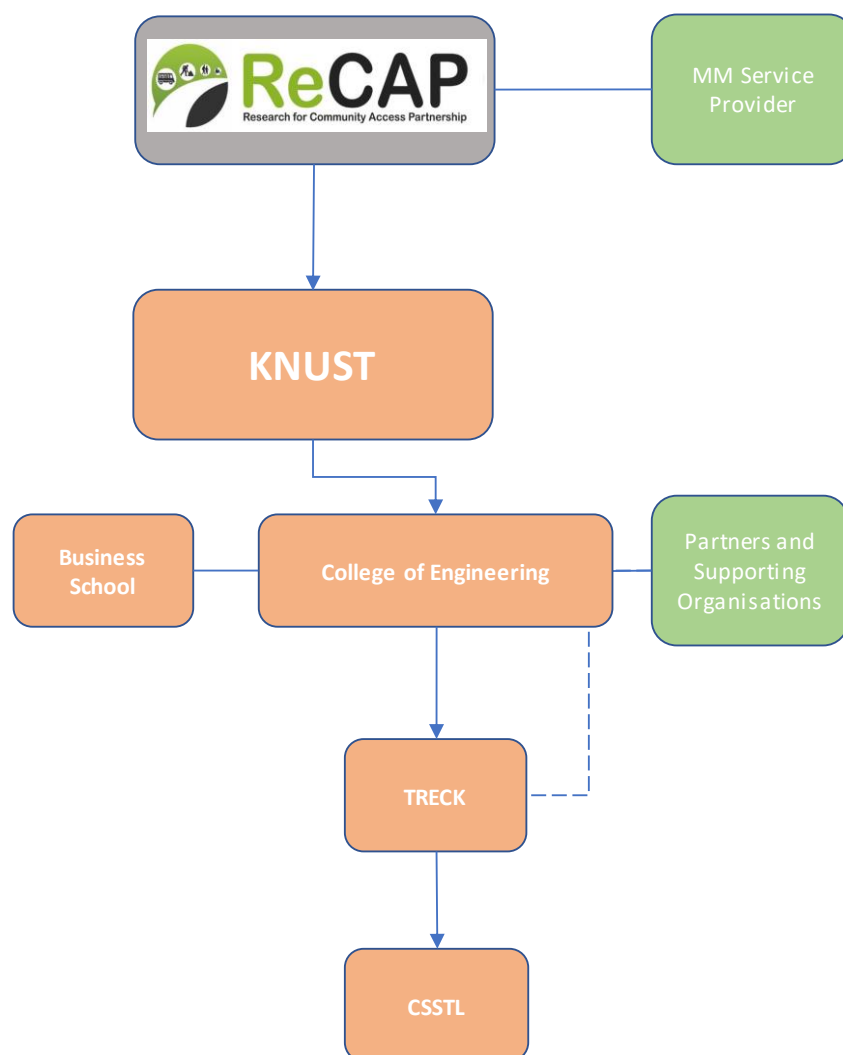
The CSSTL will be located within the College of Engineering under the KNUST Transport Research and Education Centre Kumasi (TRECK). The College of Engineering will take ownership of overall CSSTL operations and delivery of the transport-related curriculum. It will be supported by the School of Business, whose role will be to deliver the leadership and management curriculum.

The programme will be overseen by ReCAP until July 2020 when their programme concludes. From July 2020 onwards, this oversight will be transferred to the High-Volume Transport (HVT) programme. HVT will oversee and support implementation from July 2020 until they finish in 2021.

ReCAP shall be the main point of contact between the programme, partner countries and any Multilateral Development Bank (MDB) and help the CSSTL build these relationships so they are present before ReCAP ends in July 2020.

By 2022/23, following the graduation of at least 2 cohorts, it is expected that the CSSTL shall be developed to a level where it can manage implementation and ongoing development of the CSSTL itself. By then, the CSSTL and KNUST should have built links with any supporting delivery institutions, MDB, professional institutions and regional authorities.

Figure 1: Management Structure for period up to 2020

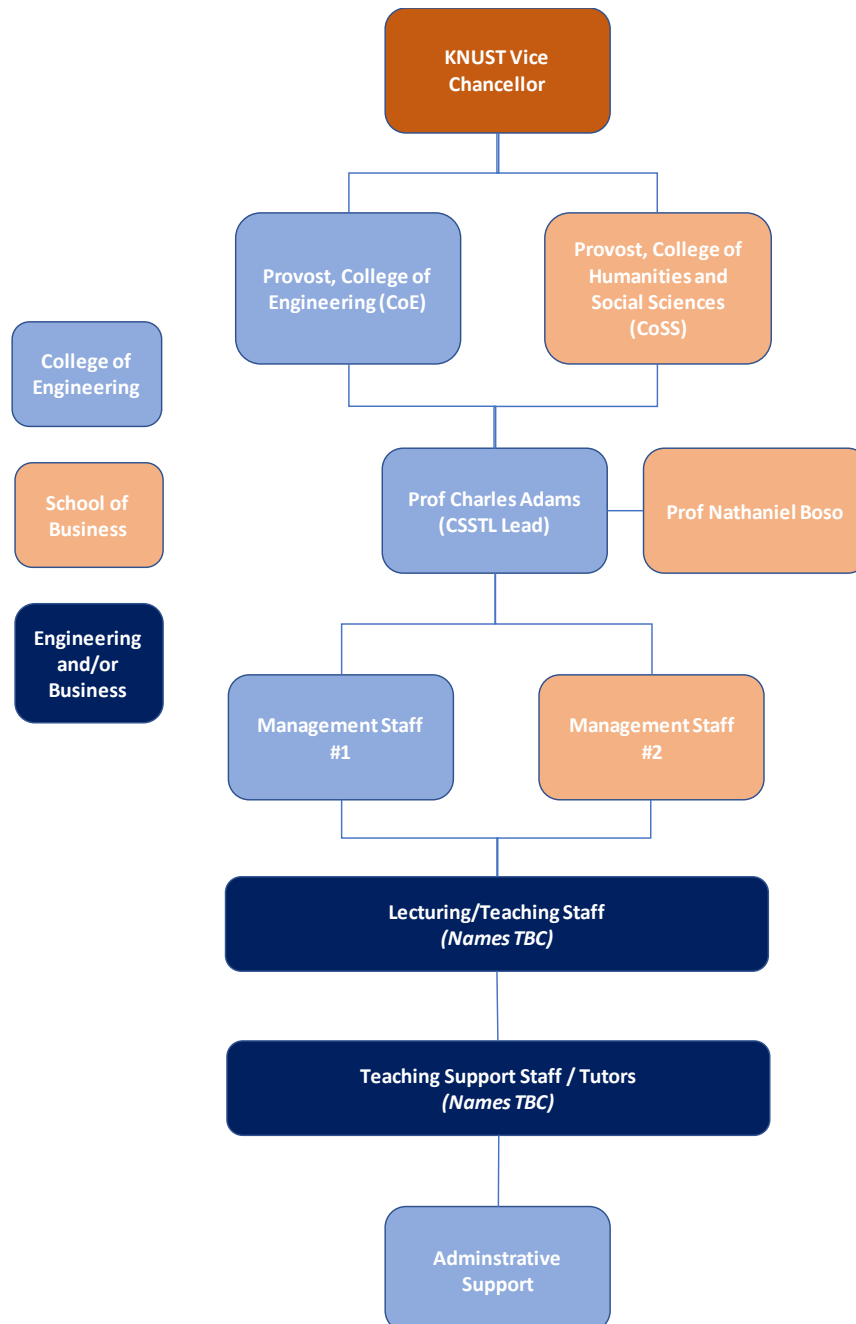


3 Management Structure

The management structure for the CSSTL is shown below, including the senior management to whom Prof Charles Adams (CSSTL Lead) has to report. This reflects the overall governance structure for the CSSTL and hierarchy within KNUST.

Prof Charles Adams will be supported by Prof Nathaniel Boso who is Dean of the Business School. Beneath Prof Adams and Prof Boso will be operations management support to be supported by ReCAP. These staff will also be provided with administrative support from TRECK / College of Engineering.

Figure 2: Management Structure for the CSSTL



4 Programme Structure

4.1 MSc in Transportation Leadership

4.1.1 Curriculum

The programme structure for the MSc in Transportation Leadership is shown in Figure 3. Candidates will be provided with a blend of technical engineering and transport, leadership, management and research project modules.

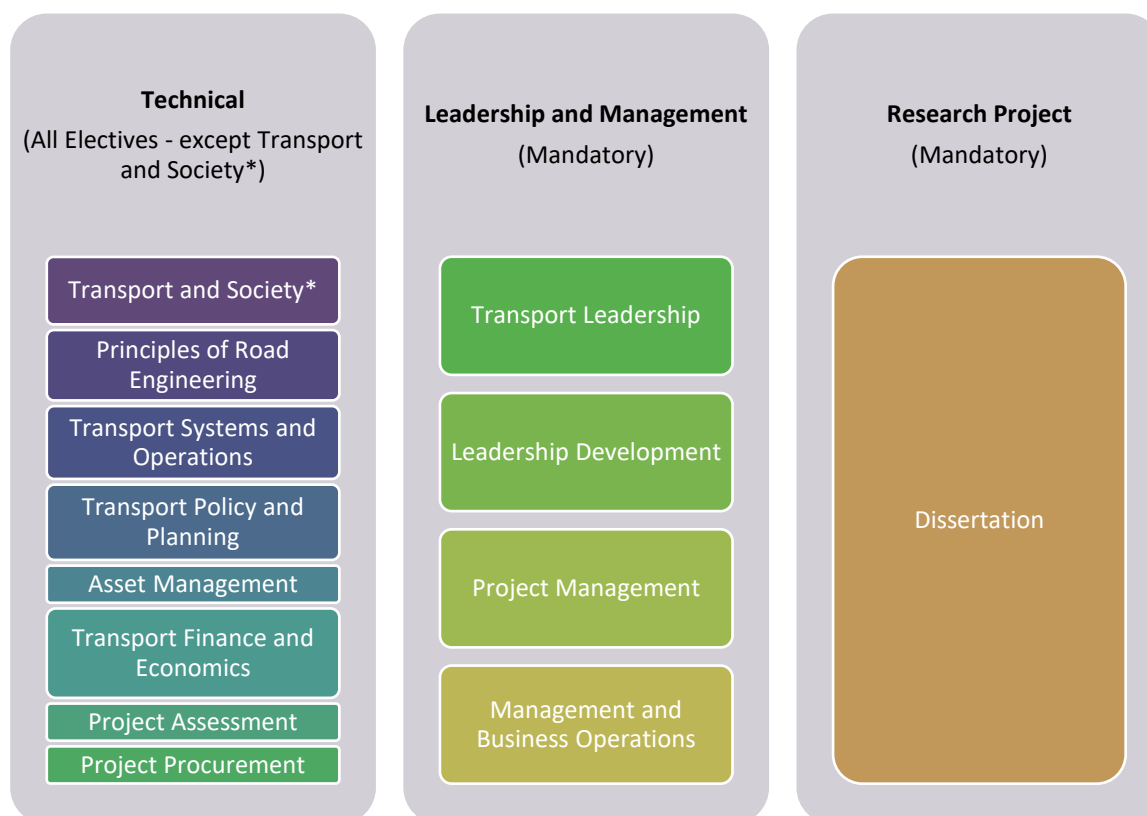
The technical modules are mostly electives, with the exception of Transport and Society. Transport and Society is not an elective because it will outline the reasons why transport is critical to the public and economy. This underpins the entire transport profession and is critical for a transport leader to understand. It is also the course to provide the situational context to the transport industry in SSA.

The other technical modules are electives and a sufficient number will need to be taken to generate the necessary credits to be awarded the MSc. It is expected that candidates will take modules that sit outside their current areas of expertise to broaden their knowledge. This will be monitored during the enrolment of candidates.

The Leadership and Management modules are mandatory for all candidates. They are what sets this programme apart from other transport and engineering post-graduate degrees.

The Research Project is also mandatory and must be taken by all students. This module will expose students to research methods and require them to undertake a research project relevant to the transport leadership context.

Figure 3: Programme Structure for the MSc in Transportation Leadership



4.1.2 Delivery Format

The MSc modules will be delivered as a series of blocks, which blend a one-week session on campus at KNUST with pre and post-block week assignments. The candidates will also be examined at the end of the one-week block period.

This delivery format is demonstrated graphically in Figure 4 and the approximate contribution of each stage to the student's module mark is also shown. This breakdown is indicative, as each lecturer retains discretion over how they wish to allocate marks between assignments and examinations within their respective modules.

This format has been chosen as experience elsewhere (e.g. at UCT) has shown it to best accommodate candidates' external needs. Given the target students are experienced professionals, they will need to balance their existing employment and personal lives with their development on this programme. Therefore, full-time attendance at university in Ghana, particularly for international students, is unlikely to be realistic.

Whilst this approach generates a need to travel on a short-term basis, it is considered the most appropriate option, particularly as delivery is flexible. This format also means candidates can be flexible about how they complete the programme and could spread the modules over one or two years.

Figure 4: Proposed Delivery Format and Contribution of each Section (%) to the Final Module Mark



4.2 CPD Curriculum

The CPD curriculum will be similar to the MSc, the difference being the delivery, as candidates only attend the one-week residential block at the KNUST campus. They are not required to complete the pre or post-block week assignments nor will they be examined.

Candidates will receive certificates of attendance for their participation on the CPD course which will contribute towards training requirements for their professional registrations.

The benefit of this approach is that it avoids the need to generate additional courses and content specific to CPD delivery. Instead CPD students sit alongside the MSc students during the block week sessions. This approach follows the same successful format that is used by UCT for their module and CPD deliveries.

It is considered that the following modules would be suitable for delivery as CPD courses:

- Transport Leadership
- Leadership Development
- Principles of Road Engineering
- Transport Systems and Operations
- Transport Policy and Planning
- Transport and Society
- Transport Finance and Economics
- Asset Management

4.3 Syllabus

The syllabus is an extensive document which provides a breakdown of the expected content and learning outcomes for each of the modules shown in Figure 3. Due to the level of detail, it is not provided here, but is available in the Curriculum Review Report in Appendix B.

4.4 Accreditation

Accreditation will be sought from the Ghana National Accreditation Board (NAB). This process will be initiated following programme approval from KNUST University Management, which is scheduled for December 2019.

The accreditation process is expected to be initiated in December 2019 following receipt of KNUST programme approval and can take up to eight months to complete. Accreditation is expected to be secured by August 2020.

International accreditation is also being explored via the Engineering Council in the UK. This process could take two years or longer, to complete depending on their requirements. The accreditors generally request to assess programme outputs/graduates as part of the accreditation process. This means one or two cohorts will need to have completed the MSc before accreditation can be finalised, hence the reason why this accreditation will not be imminent.

Other options will also be explored, such as the Agency for Quality Assurance (AQAS) in Germany, which already accredits a number of existing KNUST programmes in the water sector. AQAS accreditation is currently being sought by KNUST for their transport and civil engineering programmes, with a view towards this being achieved in 2020. It may also be possible to seek accreditation of the Transport Leadership MSc as part of this process.

5 Implementation Strategy

5.1 Overview

Figure 5 identifies the key components of the delivery, with successful achievement of each activity dependent on one or more of the others, as explained in Table 1. Underpinning all the activities are those on the critical path, shown in Figure 6. These critical items hinge on activities such as ReCAP and KNUST agreeing a contract and there being successful handover to HVT by May 2020.

Figure 5: Headline activities required for successful delivery



Initially, it was imperative that a Memorandum of Understanding (MoU) was agreed between ReCAP and KNUST. KNUST were unable to progress with procuring Management Staff and securing university approval for a new programme until the MoU was in place, hence the urgency with which this must be agreed. The MoU was agreed as of September 2019 and is attached as Appendix A.

KNUST approval is also critical to commencing subsequent tasks. These include marketing the CSSTL and MSc and initiating accreditation through the NAB. These activities cannot be initiated until KNUST University Management has given their consent to a new programme being implemented by the University.

Beyond the MoU, a more formal agreement between ReCAP and KNUST is recommended. This should be a form of contract that commits both parties to the delivery and clearly identifies each other's roles and responsibilities, the dispute resolution process and the disbursement mechanism for the allocated seed funding. This task is in progress between ReCAP and KNUST.

Table 1: Activity Schedule and Dependency List

Activity	Output	Dependencies
ReCAP Milestone Deliverables	<ul style="list-style-type: none"> Contracted deliverables to ReCAP Interim Report Business Plan Quarterly Progress Reports Final Report 	<ul style="list-style-type: none"> Delivery of all activities below
Curriculum and Programme	<ul style="list-style-type: none"> Agreed TSLDP programme structure and delivery plan Agreed curriculum between the Service Provider, KNUST and ReCAP 	<ul style="list-style-type: none"> MOU and/or contract with KNUST to secure input into developing content and identifying gaps in existing courses Support from Management Staff in developing content and establishing the courses. Requires signed MOU and/or contract to be in place between ReCAP and KNUST
Marketing and Networking	<ul style="list-style-type: none"> Attendance at key conferences e.g. T2 in Mozambique Distribution of marketing materials Webpage on KNUST website Candidate applications and enrolment 	<ul style="list-style-type: none"> Agreed programme structure and outline curriculum Programme approval from KNUST so the CSSTL and TSLDP can be marketed National accreditation within Ghana in the first instance whilst international accreditation is pending
Accreditation	<ul style="list-style-type: none"> Programme accredited nationally in Ghana Programme accredited internationally by a recognised professional body 	<ul style="list-style-type: none"> Programme approval from KNUST University Management Curriculum acceptable to accrediting bodies Quality control processes in place that satisfy accreditors
Teaching	<ul style="list-style-type: none"> Delivery of the TSLDP Masters Degree 	<ul style="list-style-type: none"> Programme approval from KNUST management Accreditation secured from Ghana NAB Course curriculum finalised and delivery content developed Lecturers and physical resources (e.g. classrooms, IT facilities etc.) booked
Agreement / Contract	<ul style="list-style-type: none"> MOU signed between ReCAP and KNUST Contract signed between ReCAP and KNUST Handover plan to HVT agreed Successful handover to HVT in May 2020 	<ul style="list-style-type: none"> Agreement between KNUST and ReCAP and co-ordination between Legal Departments when agreeing the contract and/or MoU Successful implementation in the period leading up to May 2020 Clear forward programme and objectives

Whilst KNUST and ReCAP agree contractual formalities, the Service Provider and KNUST will progress the CSSTL delivery. Figure 6 displays the key activities against the project timeline. It shows that the Masters degree will commence in September 2020. Achieving this date is dependent on all the other activities being completed on schedule.

Critical to achieving this delivery timeline is:

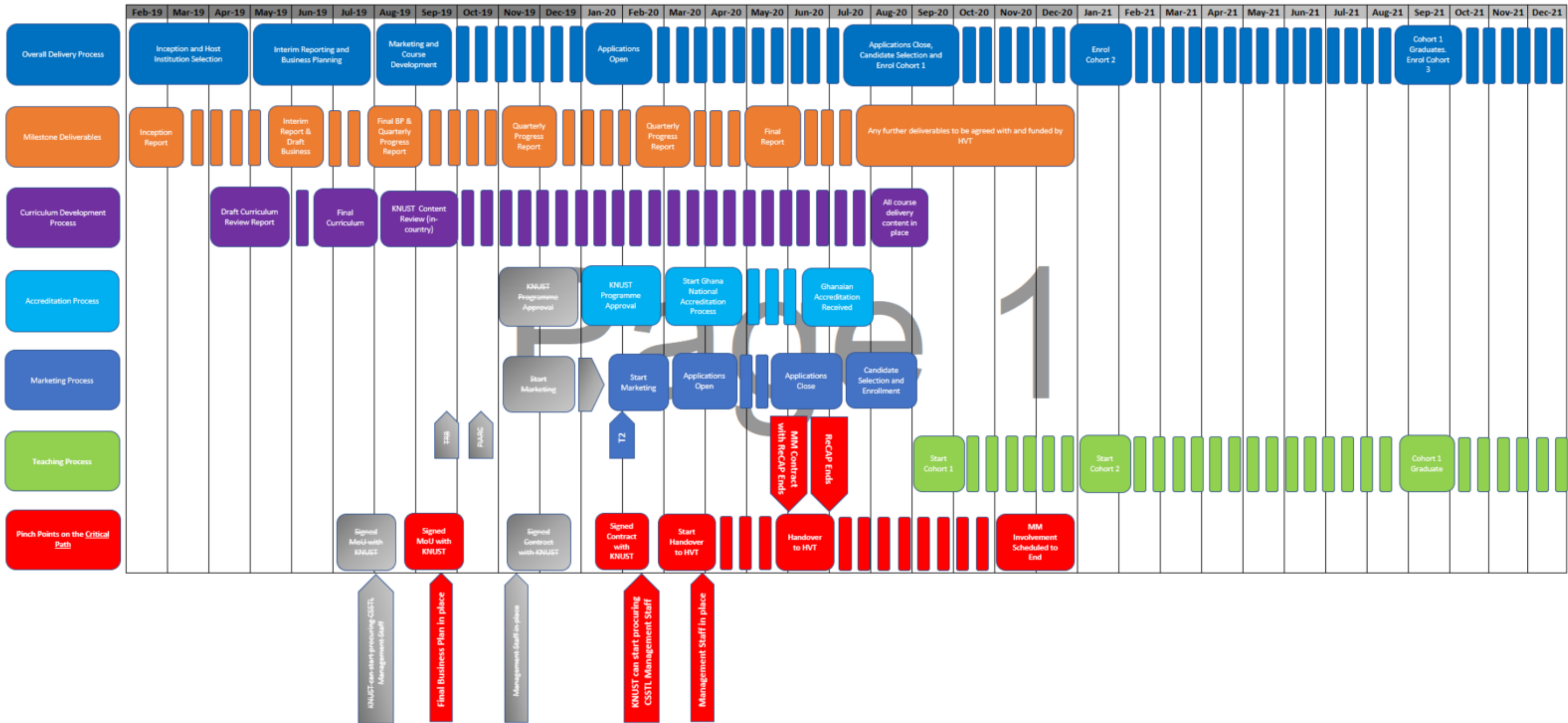
1. Establishing an outline curriculum so that programme approval can be sought from KNUST University Management. As discussed, this approval is critical to being able to commence the accreditation and marketing processes. This activity is on target, with the Curriculum Review Report, provided in Appendix B, scheduled to be converted into a standard KNUST format required for programme approval submissions. This conversion will be undertaken by Prof Adams and Prof Boso at KNUST and they will make the submission to University Management. Submission to KNUST University Management is expected to take place in October 2019, with approval expected by the end of December 2019.

2. Obtaining programme approval from KNUST University Management so that the programme can be submitted to the Ghana NAB and the accreditation process initiated. This is expected to be submitted in December 2019. The accreditation period can take six to eight months, with accreditation expected by June-August 2020. International accreditation is being treated separately and will likely take longer. This process is scheduled to commence in September 2020, but accreditation may not be secured until one or two cohorts have completed the programme. Often international accrediting bodies, such as the Joint Board of Moderators (JBM) / Engineering Council in the UK, like to see output from the programme as part of the accreditation process. Engagement with this body is ongoing at present.
3. Approval from KNUST University Management is key to being able to implement the marketing strategy, as the course cannot be publicised until this approval is secured. An agreed curriculum and syllabus for each course will also be necessary when marketing commences.
4. The earlier mentioned MOU and agreement is vital to KNUST being permitted to procure the Management Staff. Prof Adams and Prof Boso can perform the tasks expected at present, but in the coming months they will require Management Staff support to assist delivery.

Delivery of this schedule is reliant on the efficiency of external organisations, such as Ghana NAB and KNUST University Management. Moving forward, this poses the biggest risk to achieving the delivery schedule and will need to be managed closely.

Figure 6: Programme for implementation

CSSTL Implementation Programme by Key Activity



6 Marketing Strategy

6.1 Overview

The marketing strategy is provided under a separate CSSTL Marketing Strategy Report and is not included here.

7 Risks and Opportunities

7.1 Risks

The project risk register is included in Appendix C. The main risks to be mitigated through this delivery are:

1. Securing agreement between ReCAP and KNUST, as all subsequent tasks are reliant on this. An MoU has been drafted and was signed in September 2019 and is attached as Appendix A. However, it is recommended this is followed-up by a more formal agreement.
2. Inability to recruit appropriate Management Staff to support running the CSSTL. Internal staff recruitment is proposed to mitigate this risk. This may be through offering a post-doctoral researcher the opportunity to support the CSSTL with a view towards being retained in a permanent role by KNUST once the ReCAP and/or HVT support ends.
3. Payments to KNUST ending once ReCAP finishes in July 2020. Longer-term commitment is required at this stage from HVT to support KNUST. The costing forecast also identifies that additional funding will need to be secured to mitigate shortfalls in the early years whilst the programme becomes established. Proposals to support these efforts are also provided.
4. Financial support ending once HVT finishes in 2021. To mitigate this, proposals are being developed to generate alternative sources of funding to support the CSSTL until it becomes established.
5. Not achieving national or international accreditation would impact credibility and appeal to students. This would be detrimental to long-term success. This shall be mitigated through engagement with the accreditors to ensure the curriculum meets their requirements.
6. Challenges arising from differing perspectives between ReCAP and HVT, once the programme is transferred to HVT management. This shall be mitigated through engagement with HVT during the period up to May 2020 and agreeing in advance a suitable handover plan between ReCAP, HVT, the Service Provider (Mott MacDonald) and KNUST.
7. Poor quality of delivery damages the sustainability and credibility of the programme. This shall be mitigated by securing commitment from KNUST staff and leadership that there will be dedicated delivery of this programme and it shall not be considered as an additional activity, superfluous to their ongoing programmes.

7.2 Opportunities

The project opportunities register is included in Appendix C. The main opportunities to be developed through this delivery are:

1. The World Bank / TRECK partnership offers opportunities for synergies with the CSSTL. This could include opportunities for collaboration and shared funding. The TRECK World Bank representative has been requested to participate on the CSSTL Working Group to explore these further.
2. Exploration of the potential for private industry to fund a Transport Chair at KNUST who could support implementation of the CSSTL and MSc in Transportation Leadership.
3. Explore opportunities to work more closely with the High-Volume Transport (HVT) programme over the coming years. This could offer opportunities for research and/or consultancy for the CSSTL that could generate additional revenue. It should be noted that although ReCAP focuses on rural roads this programme is equally applicable to both low and high-volume traffic roads

(perhaps even more to high traffic). Future leaders will likely spend more time on high trafficked road infrastructure.

4. Utilise existing capacity building budgets within Road and Transport Authorities across Africa. The aim of the programme is to approach current senior management and leaders of road and transport authorities in SSA countries to identify potential future leaders who would benefit from following the Masters programme. Ideally, if one or two candidates can be secured on an annual basis that will greatly assist generating the student base and tuition fee revenue required for sustainability. Heads of Research Centres will also be able to identify researchers who are suitable for the course, with a view towards them becoming future leadership within these Centres.
5. Use the Masters courses as CPD offerings and sell places on the course to industry to generate additional revenue. Research Centre staff will be prospective candidates For the CPD courses offered.
6. Optimise the programme delivery so the second cohort starts in January 2021. This overlap in delivery can increase the utilisation of the programme resources and increase the revenue generated. This helps the CSSTL achieve its sustainability goals.

8 Commercials

8.1 Financial Forecasting

CSSTL costs consist of daily management and operational support, marketing, promotion and network development to achieve its Key Performance Indicators (KPI). Revenue generation is in the form of student fees generated from MSc student registrations on the Transport Leadership programme, plus CPD training slots sold to industry candidates who wish to participate on selected modules. A breakdown of the costs and revenue generation is provided in Appendix D.

A financial forecast is displayed in Figure 7 with the data summarised in Table 2. The forecast is based on securing 15 MSc students in Year 1, 20 in Year 2, 25 in Year 3 and 30 for years 4 and 5. The forecast shows the CSSTL will incur losses for the first four years, moving into operating on a cost-recovery basis from Year 5. The financial forecast also demonstrates the need for there to be a long-term support strategy covering this 5-year period, which will need to extend beyond the end of ReCAP, either in 2020 and potentially any proposed ReCAP extension.

The financial projection corresponds with expected setup and establishment times based on anecdotal evidence from counterparts at UCT and UOB, referencing typical establishment periods for similar programmes at their respective universities. It has been noted by both UCT and UOB that establishment of an MSc programme typically takes in the region of four years, as building a reputation and attracting students takes time and will need to be developed before the programme can continue organically under its own reputation.

Based on the analysis of operating costs versus incoming revenue, a minimum of 21 students per year will be required to make the MSc profitable from Year 3, assuming the CPD places are also filled. Without CPD students, 25 MSc candidates per year will be required to recover operating costs.

Figure 7: Five Year Financial Projections

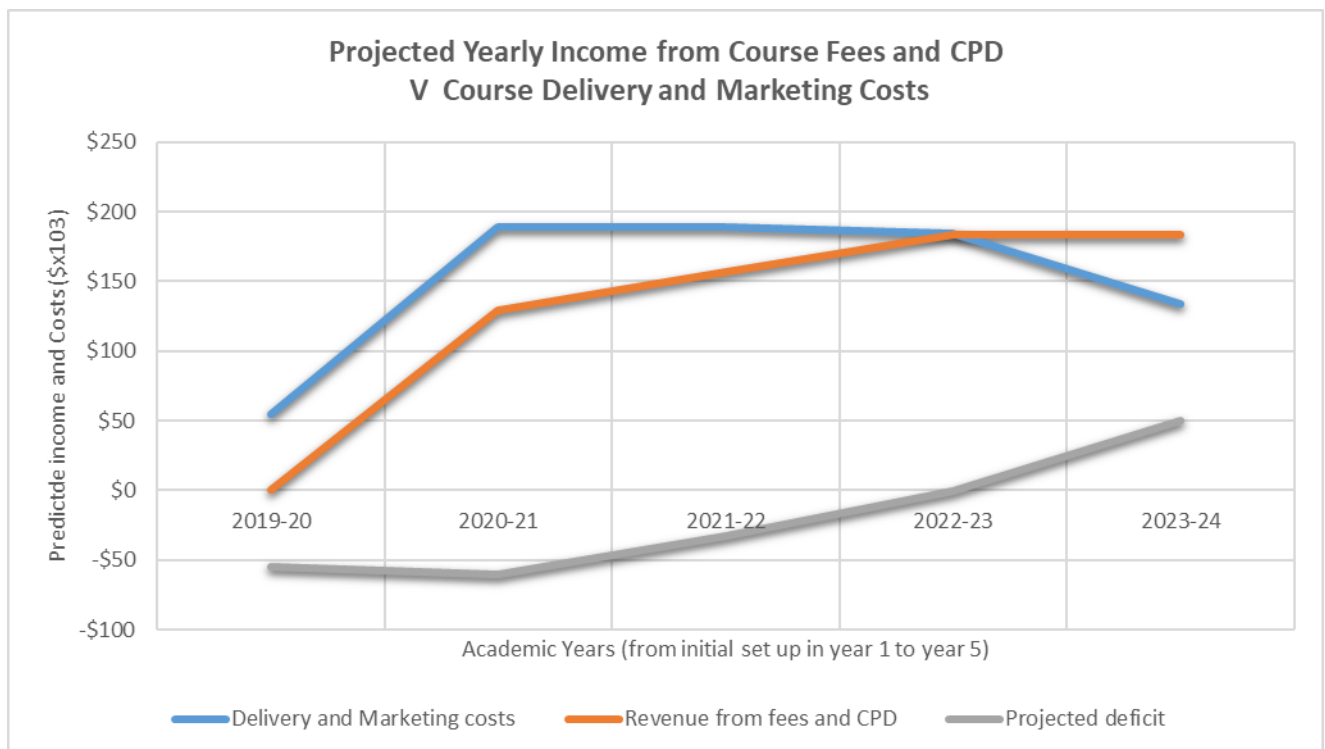


Table 2: Five Year Financial Forecast

Academic Year	Delivery and Marketing costs	Revenue from fees and CPD	Projected Deficit
2019-20	\$55,000	\$0	-\$55,000
2020-21	\$189,000	\$128,940	-\$60,060
2021-22	\$189,000	\$156,376	-\$32,624
2022-23	\$184,000	\$183,810	-\$190
2023-24	\$134,000	\$183,810	\$49,810

8.2 Revenue Generation

8.2.1 ReCAP Seed Funding

A sum of £150k is available from ReCAP as seed funding for the CSSTL, covering the period between KNUST engagement in April 2019 to the end of ReCAP in July 2020. As identified by Table 2, providing the MSc is initiated on schedule in September 2020, thereby securing a revenue stream for the CSSTL, the proposed seed funding should be sufficient to fund initial establishment operations between now and the ReCAP end date.

However, longer-term support is required to secure a sustainable CSSLT and MSc programme over the 4 to 5 year implementation period, therefore additional funding streams will need to be developed. ReCAP is currently in talks with DFID regarding a programme extension. The possibility of DFID providing longer term support, either via ReCAP, HVT or both, will be further explored.

8.2.2 MSc in Transportation Leadership

Student fees are proposed at \$6,520 per student for international students and \$2,400 for Ghanaian students. These fees may undergo further revision as the programme develops in the coming months but are the basis for the current revenue forecasting.

8.2.3 CPD

There is scope for additional revenue generation through the sale of CPD courses to industry professionals. In some SSA countries, CPD is a requirement for transport professionals to retain their professional registrations. It is proposed that the following modules will be made available as CPD courses:

- Transport Leadership
- Leadership Development
- Principles of Road Engineering
- Transport Systems and Operations
- Transport Policy and Planning
- Transport and Society
- Transport Finance and Economics
- Asset Management

Candidates will be required to attend the one-week classroom session at KNUST and would not undertake the pre-work, post-work or be assessed. It is anticipated that five places on each course (on average) will be available as CPD. It is estimated that every five places on a module could generate an additional \$2,500 (approx.) for the CSSTL. Across the eight modules on offer, this provides an additional \$20,000 (approx.) in revenue per year. If additional CPD places can be offered, the financial benefit shall increase accordingly.

8.2.4 External Support

Proposals for additional funding avenues are discussed below. They are not currently included in the financial forecast, as they are not definitive sums that can be relied upon at this stage. If such sums materialise from external organisations, the financial forecast and this Business Plan will be updated to account for them.

8.2.4.1 Transport Chair

Private industry in some instances will fund a Chair position at a University, whose role it is to develop relevant courses and graduates for industry. An example of this is Prof. M. Zuidgeest, the Education Management Specialist for the TSLDP project. Prof. Zuidgeest is the acting Transport Chair at UCT, a role funded by SANRAL.

Over the coming weeks, efforts will be made to map potential candidate organisations who could fund a Transport Chair for KNUST. It is recognised that this may be a more appealing funding mechanism for some external bodies than funding the university or students directly.

8.2.4.2 World Bank

Links and funding already exist from the World Bank through the support they are offering to TRECK. By situating the CSSTL under the umbrella of TRECK, it enables the CSSTL to benefit from synergies between the programmes. Further work shall be undertaken to determine how World Bank, and other MDB, may be able to support scholarships for student attendance on the programme. This is most important in the early years to support the establishment efforts. Once the CSSTL is operational and has developed a reputation, the need for scholarships to entice students onto the programme will reduce.

8.2.4.3 Public Bodies and Regional Organisations

Similar to the World Bank, it is envisaged that capacity building programmes offered within public transport bodies across SSA may have access to funding to support the attendance of 1-2 candidates per annum. By securing high early student numbers on the programme, this will help support establishment efforts and the sustainability goals of the CSSTL.

8.3 Business Justification for KNUST

Studies undertaken over the past two years and engagement with stakeholders across Africa has indicated that there is a knowledge gap to be filled in the transport industry with respect to development of transport leaders.

This work has shown that there is no existing programme available to candidates from SSA which addresses this knowledge gap, meaning there is a gap in the market for this programme.

KNUST is currently operating TRECK, which is supported by the World Bank. Hosting the CSSTL also helps TRECK achieve several of its KPI to the World Bank and there will be synergies that can be developed between the two programmes.

Examples of the TRECK KPI topics are shown below, including some clear overlaps with the CSSTL core objectives (e.g. gender balance, international accreditation and knowledge dissemination/reputational development through having papers in high impact journals):

1. Number of PhD (47) to be trained with emphasis on female gender and regionalisation (30% each);
2. Number of MSc (96) to be trained with emphasis on female gender and regionalisation (30% each);
3. Number of short course participants with emphasis on female gender and regionalisation (30% each);
4. External revenue generation target (e.g. CSSTL);
5. Number of papers in high impact journals indexed by Scopus;
6. International Accreditation of programmes;
7. Revamping of existing and introduction of new programmes (e.g. TSLDP);
8. Impact of Centre activities;

9. Improved infrastructure facilities and Environment for teaching;

10. Number of staff/students undertaking at least 4 weeks of internship in the project period.

The CSSTL and associated training programmes are placing high value on attendance by international students from across SSA. Supporting the establishment of the CSSTL at KNUST will help support KNUST goals to engage a greater number of international students and grow their reputation outside Ghana.

In the long-term, the vision is for the CSSTL to become a Centre of Excellence for Africa which will be recognised as an industry leader in the field of transportation and transportation leadership. This will improve brand recognition and the international ranking position of KNUST as a University in Africa and worldwide.

From an operational and commercial perspective, it has been demonstrated that physical and personnel resources exist to deliver the programme at KNUST. Through the initial support from ReCAP and the marketing strategy to be deployed to generate student admissions, it is expected the TSLDP will be operating on a cost-recovery basis by Year 5 (2023/24).

9 Monitoring and Evaluation

9.1 Overview

The purpose of this section is to provide a selection of measurable performance indicators which ReCAP, and any future funding body can use to evaluate the impact the programme is having. This has a number of components to it, and information from standard processes at Queens University Belfast and the London Business School (LBS) have been used.

9.2 Evaluating the Programme

Information was obtained from LBS about how they evaluate the impact of their programmes. This outlined good practice and topics that should be considered for TSLDP. As outlined by LBS, the reason for assessing impact includes:

1. Ensure there is a good return on investment in terms of the benefits candidates will have on the industry in SSA
2. Understand what success looks like
3. Provide a mechanism to allow fact-based enhancements to the programme
4. Enable executives to understand programme dependencies
5. Create a measure of personal, departmental and organisational success that reinforces learning at every level

A set of indicators has been outlined in Table 3 for the MSc and CPD courses, with indicators for the CSSTL provided in Table 4. Development of additional questionnaires and surveys shall be required by KNUST to address candidate feedback where required, particularly with regards post-programme assessments:

1. **Reaction:** This includes participants' reactions to the learning and the overall participant experience. This ensures that the correct environment is in place to create and sustain a conducive learning environment. This is done during and at the end of each module.
2. **Learning:** This can involve assessing knowledge gained through examinations and coursework etc. to post-programme questionnaires to determine whether attitudes have been changed. This should be done throughout the programme.
3. **Behavioural Change:** This measures the extent to which participants have applied their learning back in the workplace. This should be done through post-programme assessment in the months after the programme ends.
4. **Results:** Measures the impact of the programme on the industry and is likely to relate to specific business measures. This could be done up to five years after the programme ends, particularly with a view toward assessing if candidates have progressed into leadership roles.

Table 3: Key Performance Indicators for the MSc and CPD programmes

No.	Applicability to Options	Description	KPI	Measurement Interval
1. Student Numbers and Completion Rates				
(i)	MSc & CPD	Number of students attending the programme per year.	<10 (Poor)	Annual
			10-15 (Fair)	
			15 – 20 (Good)	
			>20 (Excellent)	
(ii)	MSc & CPD	Percentage of students who successfully complete the programme annually.	<50% (Poor)	Start assessing once Cohort 1 graduates, then continue annually.
			50-75% (Fair)	
			75-90% (Good)	
			>90% (Excellent)	
2. Career Development / Skills Development				
(i)	MSc & CPD	Candidates progressing into leadership roles* (within five years +). * A leadership role can be considered as that involving the management of project or organisational teams, technical or industry advisory roles, policy / planning advisory roles, roles within senior management of their organisation (i.e. acting as a decision-maker).	<25% (Poor)	Start assessing after the programme has been implemented for 3 years. Then update annually.
			26-50% (Fair)	
			51 – 75%- (Good)	
			>75% (Excellent)	
(ii)	MSc & CPD	Candidates progressing to getting chartered or professionally registered with a nationally or internationally recognised professional body within their field of expertise.	<25% (Poor)	Annual
			26-50% (Fair)	
			51 – 75%- (Good)	
			>75% (Excellent)	
3. Gender Balance				
(i)	MSc & CPD	Percentage of female students on the programme.	<20% (Poor)	Annual
			20-30% (Fair)	
			30-40% (Good)	
			≥40% (Excellent)	
4. Candidate Feedback				
(i)	MSc & CPD	Percentage of candidates who thought the course to be worthwhile and that it equipped them with the skills needed to move into more senior roles in the industry.	<50% (Poor)	Annual questionnaire to students
			50-75% (Fair)	
			75-90% (Good)	
			>90% (Excellent)	
(ii)	MSc & CPD	Assessment of how the candidates feel the course has been managed and run. Do they assess it as being Poor, Fair, Good or Excellent?	<50% (Poor)	Annual questionnaire to students
			50-75% (Fair)	
			75-90% (Good)	
			>90% (Excellent)	
(iii)	MSc & CPD	A separate set of questions should also be developed which probes the quality and delivery of the module content. This should be developed by the delivery university and will be similar to what they have for their other courses.	No specific KPI. Adopt any 'lessons learned' from feedback in course content updates.	Annual questionnaire to students

Table 4: Key Performance Indicators for the CSSTL

No.	Description	KPI	Measurement Interval
1. Courses Implemented			
(i)	Training programmes successfully implemented (i.e. Intervention Levels 1-3). Should be tailored to suit specific goals of CSSTL once defined – i.e. what are the expectations after Year 1, Year 2, Year 3 etc., as this criterion will vary accordingly.	0 (Poor) 1 (Fair) 2 (Good) 3 (Excellent)	Start measuring from September 2020 and monitor annually
2. Links Developed to Other Institutions			
(i)	The number of links the centre has developed (in Year 1) and is maintaining (Year 1 onward) to external universities, technical and professional institutions across sub-Saharan Africa. Company name, address and key point of contact should be provided for each link.	<15 (Poor) 15-20 (Fair) 20 – 25 (Good) >25 (Excellent)	Start measuring from September 2020 and monitor annually
(ii)	The number of links the centre has developed (in Year 1) and is maintaining (Year 1 onward) to external technical and professional institutions outside of sub-Saharan Africa. Company name, address and key point of contact should be provided for each link.	<15 (Poor) 15-20 (Fair) 20 – 25 (Good) >25 (Excellent)	Start measuring from September 2020 and monitor annually
(iii)	The number of links the centre has developed (in Year 1) and is maintaining (Year 1 onward) to International Finance Institutions, IFI and other Donor Agencies. Agency / Bank name and key point of contact should be provided for each link. <i>e.g. World Bank, African Development Bank, EU, Dept. for International Development (DFID), GIZ etc.</i>	≤1 (Poor) 2-3 (Fair) 4 – 5 (Good) ≥6 (Excellent)	Start measuring from September 2020 and monitor annually
3. Sustainability			
(i)	Funding secured for the TSLDP to cover running the course for the next...	0 Year (Poor) 1 Year (Fair) 2 Years (Good) 3+ Years (Excellent)	Start measuring from September 2020 and monitor annually
(ii)	Funding secured for the CSSTL to cover running the centre for the next...	0 Year (Poor) 1 Year (Fair) 2 Years (Good) 3+ Years (Excellent)	Start measuring from September 2020 and monitor annually
3. Knowledge Transfer and Promotion of TSLDP			
(i)	Number of conference papers, journal articles and/or articles written and published in regional or internationally available magazines, journals or conferences annually by CSSTL staff.	≤2 (Poor) 3-4 (Fair) 5-6 (Good) ≥7 (Excellent)	Start measuring from September 2020 and monitor annually
(ii)	Number of talks or presentations given at regional conferences, institutions or at the Leadership Centre (to external parties) regarding TSLDP and promotion of leadership skills development in transportation.	≤2 (Poor) 3-4 (Fair) 5-6 (Good) ≥7 (Excellent)	Start measuring from September 2020 and monitor annually

10 Networking and Partners

10.1 Purpose

To achieve the CSSTL's aim of being an African Centre of Excellence, not only must it deliver high quality, tertiary level, accredited education and training, but it should also, over time, become a repository for knowledge and expertise linked to a wide professional network of experienced transport professionals across the region. It is expected that by creating a professional pan African network between transport professionals, stakeholders in the transport sector and the cohorts of future transport leaders graduating from the CSSTL, a sustainable, vibrant and innovative centre for transport initiatives in Africa will be achieved.

10.2 Network Development

10.2.1 Professional Bodies

It is very desirable that the CSSTL is recognised and ultimately endorsed by the Engineering professional bodies across Africa, in the UK and in South Africa. The project team believes that any qualification in 'transportation leadership' awarded by CSSTL must have this international recognition to be valued by potential candidates and by their employers. The CSSTL is less likely to be successful if the qualification does not achieve this professional endorsement.

The project team has already successfully engaged with the Chartered Institution of Highway and Transportation Engineers (CIHT) in the UK and they have expressed their support for this initiative. The CIHT represents and qualifies professionals who plan, design, build, manage and operate transport and infrastructure. The CIHT have provided a member to sit on our 'Working Group' (see Section 10).

The Joint Board of Moderators (JBM) accredit Engineering degrees in the UK through the Engineering Council. The Project Team are continuing to liaise with the JBM with the intention of having the MSc in Transport Leadership recognised by them. This is an onerous process and would involve the JBM panel visiting KNUST and reviewing student output. It may take several years before this accreditation is secured, given the time it will take to generate the necessary student output and satisfy any accreditation requirements.

Contact was also made with SAICE and the ECSA in South Africa to explore whether accreditation could be sought through the South African Engineering Council. Feedback from SAICE is pending, but ECSA accreditation is not possible as they only accredit programmes to bachelor's degree level.

10.2.2 Donors and Multilateral Development Banks

The process of liaising with the Multilateral Development Banks (MDB) has commenced. A contact is available via TRECK to the World Bank and communication has been initiated with the African Development Bank (AfDB), with the purpose of identifying a suitable point of contact. It is the intention of the project team to encourage the MDBs to either support the CSSTL through direct student scholarships or indirectly via capacity building funding allocated to in-country transportation projects.

The project team has made contact with the Ghanaian World Bank representative and they have been invited to participate on the project Working Group.

10.2.3 Other Universities

The Project Team and KNUST team have a significant network of contacts across SSA. As the project develops and its future direction and content becomes more defined, the expectation is that the CSSTL will link with other Universities across Africa and with International Universities to improve the breadth of professional experience available to the students. This task will be progressed further once the Business Plan is agreed and the programme approved by KNUST Management.

11 Conclusions

11.1 Overview

KNUST has been awarded host institution status by ReCAP for the CSSTL. The purpose of the CSSTL is to become the leading Centre of Excellence in Africa in the field of transportation leadership. In achieving this, it will be establishing a new transport programme including an MSc in Transportation Leadership and associated CPD courses. Over time, it is envisaged that the reputation of the CSSTL will grow and further research and consultancy roles can be developed.

The purpose of this Business Plan is to define the establishment and operation of the CSSTL and use this to secure the support of KNUST University Management for programme approval in the first instance. Beyond this point, the Business Plan may also be used to secure support from other relevant third parties who could support KNUST and the CSSTL with teaching collaborations, quality assurance, accreditations and funding opportunities.

11.2 Business Justification

Studies undertaken with stakeholders across Africa have indicated that there is a knowledge gap to be filled in the transport industry with respect to the development of transport leaders. There is no existing programme available to candidates from SSA which addresses this knowledge gap, meaning there is a gap in the market to be filled by this programme.

KNUST is operating the TRECK, which is a transport CoE supported by the World Bank focused on West Africa. Hosting the CSSTL will help TRECK achieve its key performance indicators to the World Bank and will generate synergies between the two programmes.

The CSSTL and its training programmes are focused on securing a high number of international students (75% of total intake) from SSA. Supporting the establishment of the CSSTL at KNUST aligns with KNUST's international ambitions and will develop the university's reputation outside Ghana and West Africa.

The long-term ambition for the CSSTL is to become a CoE for Africa which will be recognised as an industry leader in the field of transportation and transportation leadership. This will improve brand recognition and the international ranking position of KNUST as a University in Africa and worldwide.

From an operational and commercial perspective, it has been demonstrated that physical and personnel resources exist to deliver the programme at KNUST. Through the initial support from ReCAP and the marketing strategy to be deployed to generate student admissions, it is expected the TSLDP will be operating on a cost-recovery basis by 2024/25.

11.3 Commercials

Table 5 outlines the commercial forecast for the CSSTL/TSLDP MSc programme. Based on the expected student attendance profile and associated revenue generated, versus the costs that will be incurred annually, it is expected that the CSSTL will begin operating on a cost-recovery basis from Year 5 onwards.

This is dependent on the CSSTL securing the level of student intake required to return a profit. This is estimated at approximately 25 students, if the CPD intake is not considered. If a full CPD intake of five students on average across the eight modules offered as CPD is achieved, the number of students required to break-even reduces to 21 MSc students.

The forecast also demonstrates that additional revenue streams need to be developed to support the CSSTL establishment and to provide longer-term support commitments than are currently in place. This is critical to meet the CSSTL and ReCAP sustainability goals.

Avenues for additional support will be explored in the coming months before Cohort 1 starts in September 2020. These included additional DFID funding via ReCAP (if extended), HVT or directly. Also, the potential

for establishing a Transport Chair at KNUST, funded by private industry will be researched. Finally, other external sources in the form of MDB and public funding channels through transport ministry capacity building programmes will be investigated.

Table 5: Five Year Financial Forecast

Academic Year	Delivery and Marketing costs	Revenue from fees and CPD	Projected Deficit
2019-20	\$55,000	\$0	-\$55,000
2020-21	\$189,000	\$128,940	-\$60,060
2021-22	\$189,000	\$156,376	-\$32,624
2022-23	\$184,000	\$183,810	-\$190
2023-24	\$134,000	\$183,810	\$49,810

11.4 Establishment Details

11.4.1 Organisational and Management Structure

The Management and Organisational Structure has been provided, demonstrating how the CSSTL will fit within the KNUST organisational structure and that the staff resources exist to support delivery. Support will also be provided by ReCAP and the Mott MacDonald-led service provider until at least May 2020. There is also scope for additional support under the HVT programme until it finishes in 2021.

11.4.2 Training Programme

The programme delivery structure and its course content has been summarised in the Business Plan and more detail is available in the Curriculum Development Report. The curriculum covers both technical transport topics and leadership development content. Due to its blended nature it will be delivered jointly between the KNUST Department for Civil Engineering and the Business School.

11.4.3 Marketing Strategy

A Marketing Strategy is under development and is available under the separate CSSTL Marketing Strategy report. It outlines the process that will be adopted to reach out to industry across Africa and secure students from the sector. The starting point for implementing the marketing strategy is securing approval for the new programme from KNUST University Management.

11.4.4 Risks and Opportunities

The risks and opportunities registers are available in Appendix C. The main risks to be mitigated through the delivery revolve around securing a contractual agreement between KNUST and ReCAP that enables all parties to progress smoothly. Several opportunities also exist, which include synergies between TRECK and the CSSTL and opportunities for additional revenue generation from the sale of CPD courses and additional research and consultancy work.

11.4.5 Monitoring and Evaluation

A set of KPI has been included in the earlier sections. The purpose of these KPIs is to determine what success looks like and monitor performance throughout implementation. Lessons learned shall be captured and used to inform programme improvements and development. This ensures the programme will be continually improved, responding to the latest industry and student needs, which is vital for sustainability.

Appendix A: Signed MoU between ReCAP and KNUST

Appendix B: Curriculum Report

Appendix C: Risk and Opportunities Register

Appendix D: Breakdown of the costs and revenue generation

Indicative costing to set up the CSSTL (USD \$)						
		Yr- 2019	Yr- 2020	Yr-2021	Yr-2022	Yr-2023
Centre Management and Governance						
5.1	Centre Management expenses (facilities, office consumables and meetings and overheads)	5,000	10,000	10,000	10,000	0
5.2	Recruit Operations Manager	5,000	24,000	24,000	24,000	24,000
5.3	Provide Project management support	5,000	15,000	15,000	15,000	15,000
5.4	Financial accounts preparation, Auditing of accounts		5,000	5,000	5,000	5,000
5.5	Apply for accreditation (including gap assessment/ self evaluation, National and International)	5,000	10,000	20,000	20,000	
5.6	Guest lecturership/ Exchanges (Flight and Accomodation)	5,000	15,000	15,000	15,000	15,000
5.7	Develop course material (12 modules 9 full development @7500)	5,000	30,000	20,000	20,000	
5.8	Marketing and student recruitment	5,000	10,000	10,000	5,000	5,000
	Subtotal	35,000	119,000	119,000	114,000	64,000
	Cumulative		154,000	273,000	387,000	451,000
Visibility, Sectoral Engagement and Professional Networks						
5.9	Participate and maintain Professional Networks		10,000	10,000	10,000	10,000
5.10	Local and international travel to stakeholder meetings, networking, conferences	10,000	20,000	20,000	20,000	20,000
5.11	Stakeholder engagement/workshops for research prospecting	5,000	20,000	20,000	20,000	20,000
5.12	Fund raising events	5000	20,000	20,000	20,000	20,000
	Subtotal	20,000	70,000	70,000	70,000	70,000
		55,000	189,000	189,000	184,000	134,000
	Cumulative Sum (Programme plus CSSTL centre Activities)	55,000	244,000	433,000	617,000	751,000
	* cost of Flight for 1 person, hotel for 4 days conference assumed to be USD\$5000, the indicative costs considers costs of achieving some of the indicator					
Notes						
5.1	Facilities / office costs - assume mid year 2019 start,					
5.2	Salary and benefits for Fulltime Operations manager					
5.3	Administrative and programme management support provided by additional leadership support. accounting etc					
5.4	Hiring of accounting and audit firm to audit the accounts of the CSSTL					
5.5	Programme accreditation, stakeholder consultations, gap assesment etc.					
5.6	Travel expenses both local and Foreign; this is based on 2 staff undertaking visit to two partner countries.attendance to workshops. conferences etc.					
5.7	Guest lecturership/ Exchanges (Flight and Accomodation)					
5.8	Marketing and student recruitment					
5.9	Participate and maintain Professional Networks					
5.10	Local and international travel to stakeholder meetings, networking, conferences					
5.11	Stakeholder engagement/workshops for research prospecting					
5.12	Fund raising events for CSSTL					

Anticipated Income from fees and CPD

Academic Year	GBP Income	USD Income
2019-20	£84,588	\$0
2020-21	£107,450	\$128,940
2021-22	£130,313	\$156,376
2022-23	£153,175	\$183,810
2023-24	£153,175	\$183,810

Anticipated cost of delivery

Academic Year	Delivery and Marketing costs	Revenue from fees and CPD	Projected Deficit
2019-20	\$55,000	\$0	-\$55,000
2020-21	\$189,000	\$128,940	-\$60,060
2021-22	\$189,000	\$156,376	-\$32,624
2022-23	\$184,000	\$183,810	-\$190
2023-24	\$134,000	\$183,810	\$49,810