



# Interdisciplinary collaboration: working with employers and practitioners to inform curriculum design SHIFT 2023

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Highway  
engineers and  
ecologists work  
together on a  
regular basis...

# National Highways

“We have become the first major roads organisation to achieve a globally recognised accreditation for our commitment and ambition to cut carbon. Our carbon management system has achieved PAS 2080 accreditation, recognising our plans to reduce carbon during the design, construction, and operation of England’s strategic road network.”



- “We must always keep the environment in mind in everything we do, and this accreditation is a clear recognition of the hard work done by National Highways and the innovation taking place across our roads to reduce our environmental impact.”

Roads Minister Richard Holden

# CIEEM Academic Special Interest Group

Aim: to bridge the gap between  
academia/research & practice



**What highways engineers want  
from ecologists and ecologists  
from the engineers**

*Would a conference for ecologists and engineers  
based on bridging the gap between disciplines  
be useful?*

*How about a working group to look at the  
feasibility for this?*

# AIM

To explore ways to improve working relationships between ecologists and highway engineers to increase efficiency of project delivery, economy viability and benefit the environment.

This will be done by sharing knowledge and best practice using case studies as examples, potential causes of conflict, and identify areas for further research.

Sponsored by:





## Highway Engineering and Ecology - A Roadmap for getting it right?"

16<sup>th</sup> November 2022 – 9.15am – 4.15pm followed by reception & networking

Chartered Institution of Highways & Transportation, 119 Britannia Walk, Islington, London

BOOK YOUR PLACE THROUGH [EVENTBRITE HERE](#)



# Give and take!

Invitation made clear delegates would be expected to actively contribute by sharing knowledge, identifying potential causes of conflict, and areas for further research.

## Morning presentations:

- **National Highways** and the Environment
- **Lower Thames Crossing** – delivering a major highway scheme in a biodiversity crisis
- **The Local Authority Perspective** – managing competing agendas for road users and nature
- **Ebbfleet Garden City** - the challenges of delivering major new infrastructure in harmony with the environment
- **A31 Highways Scheme Ringwood** – Delivering a major scheme in a internationally protected area

## Afternoon:

- Focus groups to add to questionnaires



# Participatory Research 1: Quantifying the problem

- Have you experienced any delays, misunderstandings or communication difficulties when working with environmental issues on highways schemes?

**100% replied yes**

- How often?
  - Engineers: almost half said regularly/50% of jobs/on most schemes
  - Ecologists: frequently/more often than not/ >50% of the time/on all projects to a greater or lesser degree
  - Others: 3-4 per year/frequently/75% of projects/All the time



# Afternoon Workshops

<p>Engineers &amp; Ecologists usually <b>agree</b> on...</p> <p>don't want to have a negative effect on the environment as a result of our schemes.</p> <p>Skills shortages All roads lead to management</p>	<p><b>Ecology priorities</b> that are often not priorities for Engineers...</p> <ul style="list-style-type: none"> <li>Sticking to plans &amp; consent processes</li> <li>skills shortages</li> <li>Minimising impact due to WA, welfare &amp; survey times</li> </ul>
<p>Engineers &amp; Ecologists usually <b>disagree</b> on...</p> <p>'whether or not there are bats in a bridge' 'opportunities to retain trees &amp; hedgerows' Default to do maximum, not do minimum. Construction clearance.</p>	<p><b>Engineering priorities</b> that are often not priorities for Ecologists...</p> <ul style="list-style-type: none"> <li>Smaller jobs not enough &amp; a time to 'do the design thoroughly'</li> <li>skill shortages</li> <li>space for working areas, welfare, haul roads, materials storage</li> </ul>
<p>Three lessons to learn ...</p> <p>EC1 - get contractors involved early enough.</p> <p>Spent enough time on planning / design stages.</p> <p>Get workforce to engage with flora &amp; fauna. (Education) + Inductions for designers / engineers</p>	<p>Three ways to resolve these...</p> <ol style="list-style-type: none"> <li>Get right people involved at the right time - when key decisions are made</li> <li>Get the right people with the right experience (&amp; competence)</li> <li>Write documents, so that site staff can understand. - Graphical.</li> </ol>

Gro	
Ecologists	
4	2

Please discuss and answer

- Q1 What are the most common areas of difficulty?  
Disconnect financial year vs wildlife  
Client understanding Pressures in disciplines
- Q2 What would engineers like ecologists to understand a  
Ecology calendars are hard to understand
- Q3 What would ecologists like engineers to understand a  
Engineering terminology is hard to understand
- Q4 What are your top three suggestions for getting it right?  
Consistency in project timelines to consider whether ecologists are needed early in project timelines. → Trackers in projects  
→ all the way back to degree level  
Knowledge Sharing and training  
↳ in a collaborative way across all parties and stakeholders  
↳ language and communication  
↳ having a dictionary or reference sheet

# Participatory Research 2: Finding Solutions

Top issues:

- 1 communication
- 2 understanding each other's roles and responsibilities
- 3 collaborate as early in the project as possible

Suggestions:

- A dictionary
- Forums/events/shared professional space

## Building Bridges: The case for inter-faculty learning

Gemma Ahearne and Matt Murphy argue that in order to prepare students for the workplace, they need to be able to communicate across different disciplines.

COMMENT | 8/12/22



<https://wonkhe.com/blogs/building-bridges-the-case-for-inter-faculty-learning/>

# Implications for practice-based learning

So how can we better prepare our students for work?

- Language issues - terminology
- Teaching across silos good idea but... university processes and organisations
- Academics are not (always) in touch with industry
- Role play opportunities
- Too much in curricula already?
- Within current...constraints we cannot do this...





## Students 'want career-focused courses but not more regulation'

More than half of those polled by Heki and NUS express support for education designed with employment in mind

December 8, 2022

Tom Williams

Twitter: @TWilliamsTHE

<https://www.timeshighereducation.com/news/students-want-career-focused-courses-not-more-regulation>



# What we want to do...

We need to be running short supplementary courses for EC ecologists and engineers

We could run at the same time (pilot?)

Smooth out 'bumps in the road'!

Look at the future world of working: Buildings Information Modelling, Virtual Reality, Augmented Reality, co-working in cyber space



# DISCUSSION