



## Candidate Information

<b>Position:</b>	Research Fellow, Intelligent Infrastructure
<b>School/Department:</b>	School of Mechanical and Aerospace Engineering
<b>Reference:</b>	22/109983
<b>Closing Date:</b>	Monday 25 July 2022
<b>Salary:</b>	£34,304 per annum.
<b>Anticipated Interview Date:</b>	Friday 5 August 2022
<b>Duration:</b>	Fixed Term available until 31st March 2024

### JOB PURPOSE:

We are seeking a highly motivated post-doctoral researcher in the field of fleet sourced monitoring. The post holder will join the Intelligent Infrastructure Group and the Sir William Wright Technology Centre (W-Tech) at Queen's University Belfast and will support activities in funded EPSRC Prosperity Partnership, StreetZero, to explore the implications of a move towards increasing electrification of bus vehicles. The researcher will work in a multidisciplinary team with researchers from vehicle engineering, civil engineering and policy to undertake fundamental research in fleet sourced monitoring. By stimulating a digital transformation in the monitoring, processing and analysis of information about our infrastructure, we can predict how it will perform under changing vehicle loads, cycles of loading and environmental factors, and move towards Smart Infrastructure.

### MAJOR DUTIES:

1. Development of condition monitoring; primarily on bridge structures due to the critical role they play in many UK cities in sustaining accessible bus networks.
2. Develop systems for drive-by monitoring by (a) assessing energy requirements of each activity (sensing, transmission of data), (b) the output and reliability of the transfer, and (c) reliability of wireless sensor data using drive-by monitoring.
3. Assess change in infrastructure condition by using drive-by sensors. Damage leads to changes in dynamic properties. The first natural frequency can be insensitive to damage, but provisional work has indicated that 1st natural mode shapes may show strong potential. This will require Participation in testing activities in conjunction with the industrial partners at testing sites, as required.
4. Write high quality outputs for publication in top international journals in the field.
5. Support the supervision of PGR students and other research staff within Civil Engineering and the W-Tech Centre.
6. Carry out undergraduate supervision/demonstrating/teaching duties under direction. Carry out routine administrative duties as requested, e.g. arranging research group meetings.
7. Critically evaluate academic papers, journals and textbooks to provide state of the art in the research area.
8. Attend relevant conferences, consortium meetings, seminars or training days as required for the post.
9. Carry out any other duties designated by a line manager and which fall under the general remit of the post.

### ESSENTIAL CRITERIA:

1. Have, or are about to obtain, a PhD in, Civil/Structural/Mechanical/Aerospace Engineering or a related discipline.
2. Have obtained a first or upper second degree (or equivalent) in Civil/Structural, Mechanical, Aerospace, Electronic, Physics, Applied Mathematics or a related discipline.
3. A minimum of three years' relevant research experience in:
  - Structural health monitoring (SHM) of civil infrastructure.
  - Use of sensors for SHM and post processing techniques to establish frequency/mode shapes.
4. Experience of FEA analysis.
5. Demonstrate an ability to manage your own research and to plan research activities effectively.
6. Excellent verbal and written communication skills.
7. Demonstrate experience of communicating with, developing and maintaining academic and/or industrial relationships.
8. Must be willing to work flexibility and travel to partner sites and testing sites as necessary.

**DESIRABLE CRITERIA:**

1. Experience of drive by monitoring.
2. Experience in data analytics.
3. Experience in programming in MATLAB®, or similar high level language.
4. Ability to meet mobility requirements of the post.