

**Software Development Manager**

**Competition Information Booklet**

Please read carefully.

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| **Position:** Software Development Manager**Grade:** Assistant Principal Higher**Directorate:** Transport Technology**Reporting to:**  Head of Transport Technology Systems**Location:** Haymarket House, Smithfield, Dublin 7 with a blended working  model.**Starting salary:** €86,811Closing date for receipt of completed applications:**12pm (noon) on Friday, 29th November 2024****Contact:** careers@nationaltransport.ie |

The National Transport Authority is committed to a policy of equal opportunity.

**Overview of the National Transport Authority**

The National Transport Authority (NTA) is a statutory body established by the Minister for Transport on 1 December 2009.

At national level, the Authority has responsibility for securing the provision of public passenger land transport services, including subsidised bus and rail and light rail services. The Authority also licenses public bus passenger services delivered by private operators and has responsibility for the regulation of the small public service vehicle (SPSV) industry (taxis, hackneys and limousines). Other areas of responsibility include the State’s rural transport programme, integrated information systems for public transport customers, management of the Integrated Ticketing Scheme for Ireland (the Leap Card system), and regulation of vehicle clamping.

Within the Greater Dublin Area (GDA) the Authority carries additional responsibilities including:

* Strategic planning of transport;
* Development of an integrated, accessible public transport network;
* Promoting cycling and walking;
* Provision of public transport infrastructure generally including light rail, metro and heavy rail; and
* Effective management of traffic and transport demand.

The GDA includes the local authority areas of Dublin City, Fingal, Dún Laoghaire-Rathdown, South Dublin, Kildare, Meath and Wicklow.

The Authority’s Capital Investment Programme includes an exciting and challenging range of projects and programmes for development and delivery over the coming years. These include mega-projects such as MetroLink, BusConnects Dublin and the DART+ Programme, together with numerous other major projects/programmes in the heavy rail area, light rail area, bus infrastructure and public transport fleet, in addition to a large portfolio of projects in the active travel area. Along with other initiatives in the areas of micro-mobility, transport technology and climate adaption, there are stimulating and rewarding opportunities to make a real contribution to enhancing Ireland’s overall transport system.

Further information on the Authority is available on its website [www.nationaltransport.ie](http://www.nationaltransport.ie)

The National Transport Authority wishes to recruit a suitably experienced and qualified individual to the role of Software Development Manager. Successful candidates may be placed on a panel from which future vacancies may be filled.

**Systems Development Team**

The NTA’s Transport Technology (TT) department is responsible for overseeing the delivery and subsequent operation of technology solutions across four principal areas: Ticketing (Transport For Ireland (TFI) Leap Card, TFI Go), Automatic Vehicle Location (AVL), Real-Time Passenger Information (RTPI) and National Journey Planner systems (TFI Live). The solutions are provided by a range of external vendors. The *Transport Technology Systems Team* sources, develops and delivers new systems and enhancements, both via dedicated project teams involving external suppliers as well as via in-house resources. The *Transport Technology Operations Team* ensures that the supplied systems are operated and maintained within agreed service levels, manages service delivery, and handles all incidents and outages with live systems.

The Systems Development Team develops and maintains several applications that underpin the Leap Card system and the Automatic Vehicle Location systems. The systems team also develops and supports several test and development tools and supports external ticketing equipment suppliers who integrate with the Leap Card scheme.

The Systems Development team overseen by this role consists of 13 people, and is organised in two groups, each led by an EG1 level engineer. The first team supports ongoing Leap operations, and the second team supports new projects, development initiatives and new integrations.

The systems and applications that the team are responsible for include the following:

* Product Apportionment System (PAS), an Oracle stored procedure database driven tool that processes transactions and apportions Leap Card fare foregone across different participants.
* Multi-Bank Sub-System (MBSS), a reformatting tool that converts outputs into the file format required for submitting to NTA’s bank.
* Scheme Wide Codes (SWC), a reference catalogue of identifiers for the Leap Card scheme.
* Test Card Creator, a python tool complied as a windows app used to create Leap Card images for test purposes.
* Refunds Tool, a ruby-based tool supporting internal financial processing.
* Configuration Data Generator (CDGen), a web-based tool used to generate configuration datasets used to configure ticketing systems in the Leap Card scheme.
* Product Definition Language (PDL) creator, an XML based tool to generate ticket definitions used across the Leap Card scheme.
* Fares Aggregator, a series of python scripts used to reformat public transport data so that it can be imported into the TFI Go mobile ticketing application.
* Leap Inspection Application, an android app built for revenue protection teams to read the Leap Card that interacts with a Leap Secure Access Module (SAM) to decrypt the data.
* Key Management Facility (KMF), an air-gapped laptop and specialist SAM configuration application and associated SAM printer.
* Secure Access Modules (SAMs), cryptographic hardware inside Leap Card SCIM readers to perform mutual key authentication utilising 2K3DES encryption, configured using the KMF.
* Scheme Wide Data Repository (SWDR), an Azure web-based app using Django, PostgreSQL db, used to be the central configuration data source for all transport operator planning and real-time data.
* Smart Card Interface Module (SCIM) firmware, embedded software running on dedicated Leap Card hardware used to manage the communications and security for interacting with Leap Cards. The SCIM itself is a multi-layer integrated circuit board manufactured for NTA and used for managing RFID interactions with the Leap Card. It is being superseded by software implementations.
* Virtual Smart Card Interface Module (vSCIM), a terminal software library implementation (in C) of the SCIM firmware used in an increasing number of smart card ticketing machines supporting Leap Card nationwide. Integrators would either use the Terminal API provided by the ITS Terminal SCIM Library (TSL) or interface directly into the vSCIM library. TSL & vSCIM currently supports:
	+ Windows (32-bit libraries)
	+ Linux (32-bit libraries)
	+ cVEND Feig embedded Linux 32-bit
	+ Android – Native C code (32-bit libraries)
	+ Ingenico Telium OS
	+ A Hardware Abstraction Layer for the communications layer means that the commands for the custom SAM API and DESFire do not have to be implemented. The terminal developer only has to implement the interface to deliver commands to their SAM and DESFire readers.
* vSCIM TSL Test Harness, a python-based test tool for validating the TSL library.
* Tier-3 Participant System (T3PS), a reference design implementation being built to support the NGT Supplier’s future integration into the Leap card system.

**Duties and Responsibilities**

The Software Development Manager leads the Systems team of the Transport Technology Department and ensures appropriate design oversight of systems developed and provided by third party suppliers, as well as developing and maintaining the various inhouse applications and test tools. This role encompasses both technical leadership and people management responsibilities. A key responsibility will be to develop the team’s skillsets and identify potential innovation opportunities for the team as it is anticipated that the importance of the embedded software elements shall gradually diminish, and cloud-based applications become dominant.

**Key Accountabilities**

* Ensures that the NGT supplier successfully integrates with the Leap Card scheme using the NTA’s vSCIM libraries.
* Reviews the technical design of systems provided by external suppliers and ensure that the implemented system satisfies NTA’s technical requirements and specifications.
* Initiates projects by securing internal buy-in from senior managers and directors for implementing new systems, new applications, or major changes.
* Initiates public procurements as required to secure technical resources, systems and/or advice.
* Liaise with internal departments and teams (e.g. ICT, PMO) as required to ensure implementation of the appropriate technical designs.
* Manages and develops the team including identifying training requirements and performing performance reviews.
* Brings expertise and technical leadership to bear to solve problems and technical challenges.
* Assigns team members to projects and initiatives.
* Ensures team has the applications, access rights (e.g. sandbox) and developments tools necessary to complete their tasks.
* Manages technical resource supply contract and secures appropriate resources and skillsets as required to deliver initiatives.
* Manages the interface with the Operations team.
* Ensures the ongoing support and development of the inhouse applications.
* Identifies innovation opportunities including proof-of-concept developments, technology trials and other developments or enhancements that could improve the customer offering.

**Skills**

* Software development team management experience.
* Technical analysis and ability to write technical specifications suitable for inclusion in contracts and public procurement competitions.
* Exemplary communication skills, able to explain technical matters clearly and precisely to both non-technical senior colleagues as well as to technical colleagues and external suppliers.
* Highly motivated and enthusiastic – can work on own initiative.
* Takes ownership of issues and tasks.
* Building collaborative relationships with peers, colleagues, and suppliers.
* High degree of personal integrity and determination.

**Note:** The functions and responsibilities initially assigned to the position are based on the current organisational requirements and may be changed from time to time. The person appointed require the flexibility to fulfil other roles and responsibilities at a similar level within the Authority.

**Essential Criteria**

**Please note: In order to satisfy the shortlisting panel that you meet these criteria you must explicitly reference how you meet same in your application. Failure to demonstrate these may prevent your application progressing to future shortlisting stages.**

Each candidate must meet the following requirements at the time of the competition closing:

1. Hold a minimum of a NFQ level 8 degree qualification in a relevant discipline, being software engineering or information technology;
2. Have at least 7 years’ satisfactory experience developing for transaction processing systems, financial systems, or related systems;
3. Have at least 3 years’ experience managing people;
4. Have sufficient experience of android/mobile technologies;
5. Have sufficient experience of multiple cloud computing platforms;
6. Have a solid understanding of Radio Frequency Identification (RFID) technology, including how RFID tags, readers, and antennas work. This includes knowledge of frequency bands, signal propagation, and data transmission protocols used in RFID systems;
7. Have hands-on experience of embedded development using either C or C++;
8. Have knowledge of Security Protocols and Cryptography, e.g. DES, AES.; and
9. Have experience of embedded systems and microcontroller programming ideally for RFID.

**Desirable Criteria**

**Please note: Should further shortlisting be required after essential criteria above, a selection of the following may be assessed.**

The ideal candidate will also have:

1. Familiarity with standards and protocols related to NFC, contactless and contact smart cards and understanding how smart cards communicate with readers (e.g., ISO/IEC 7816 APDU - Application Protocol Data Units and ISO/IEC 14443) and how to manage secure transactions over these communication channels;
2. Knowledge of Operating Systems Kernel, and in particular driver development;
3. Smart Card Filesystems and their differences in terms of format, protocol, internal arrangement, and security features, e.g. NXP Mifare® DESFire®;
4. Experience with using Flash and FeRAM memory types in embedded hardware;
5. Experience with microcontrollers programming, ideally ARM 32bit;
6. Experience of software development using Python;
7. Experience of public procurement including requirements definition and tender assessments;
8. Experience of outsourced systems development and implementation projects as client technical representative;
9. Experience of implementing and/or complying with PCI-DSS;
10. Have experience of Transport Technologies such as ticketing systems, AVL and/or RTPI; and
11. Excellent oral and written interpersonal and communication skills with the ability to effectively advocate for the Systems Team and explain complex technical information to a non-technical audience.

**Remuneration**

**Salary Grade: Assistant Principal Higher**

**Salary Scale: €86,811, €90,112, €93,423, €96,732, €100,039, €101,973, €105,253 (LSI1),**

**€108,544 (LSI2)**

**Personal Pension Contribution (PPC) rate.** This salary is payable to an individual who is required to make a personal pension contribution (PPC) to their main pension (in general those persons whose initial appointment to the Public Service is on or after 6th April 1995).

**€82,464, €85,605, €88,758, €91,893, €95,037, €96,869, €99,999 (LSI1),**

**€103,119 (LSI2)**

**Non-Personal Pension Contribution (non-PPC) rate.** This salary is payable to an individual who is not required to make a personal pension contribution (PPC) to their main pension scheme.

**Annual Leave:** 30 days per annum. This leave is based on a five day week and is exclusive of the usual public holidays.

**Note:**

* entry will be at point 1 of the scale and will not be subject to negotiation;
* different pay and conditions may apply if, immediately prior to appointment the appointee is already a serving Civil Servant or Public Servant;
* the rate of remuneration may be adjusted from time to time in line with Government pay policy.

**Contract:** Permanent Contract

**Probation:** There is a 6 month probationary period which may at the discretion of the CEO be extended to 10 months.

**Selection Process**

Prior to completing your application please read the Important Candidate Information Booklet on our careers page here: [www.nationaltransport.ie/about-us/careers](https://www.nationaltransport.ie/about-us/careers/)

**How to Apply**

Please submit your application in one single word document or PDF referencing the title of the role you wish to apply for in the subject of the email to careers@nationaltransport.ie with the following:

1. A comprehensive cover letteroutlining why you wish to be considered for the post and where you believe your skills and experience meet the requirements for the role of Software Development Manager;
2. A comprehensive CV (not to exceed 3 pages); and
3. A fully completed Key Achievements Form (attached).

Please note that omission of any or part of the 3 requested documents, as set out above, will render the application incomplete. Incomplete applications will not be considered for the next stage of the selection process.

**Closing Date**

**The closing date and time for applications is strictly 12pm (noon) on 29th November 2024. Applications received after the specified deadline cannot be accepted.**

If you do not receive an acknowledgement of receipt of your application within 2 working days of applying, please email careers@nationaltransport.ie.

**Software Development Manager - Key Competencies**

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| **Leadership** | Actively contributes to the development of the strategies and policies of the Department/ Organisation |
| Brings a focus and drive to building and sustaining high levels of performance, addressing any performance issues as they arise |
| Leads and maximises the contribution of the team as a whole |
| Considers the effectiveness of outcomes in terms wider than own immediate area |
| Clearly defines objectives/ goals & delegates effectively, encouraging ownership and responsibility for tasks |
| Develops capability of others through feedback, coaching & creating opportunities for skills development |
| Identifies and takes opportunities to exploit new and innovative service delivery channels |
| **Judgement, Analysis & Decision Making** | Researches issues thoroughly, consulting appropriately to gather all information needed on an issue |
| Understands complex issues quickly, accurately absorbing and evaluating data (including numerical data) |
| Integrates diverse strands of information, identifying inter-relationships and linkages |
| Uses judgement to make clear, timely and well-grounded decisions on important issues |
| Considers the wider implications, agendas and sensitivities within decisions and the impact on a range of stakeholders |
| Takes a firm position on issues s/he considers important |
| **Management & Delivery of Results** | Takes responsibility for challenging tasks and delivers on time and to a high standard |
| Plans and prioritises work in terms of importance, timescales and other resource constraints, re-prioritising in light of changing circumstances |
| Ensures quality and efficient customer service is central to the work of the division |
| Looks critically at issues to see how things can be done better |
| Is open to new ideas initiatives and creative solutions to problems |
| Ensures controls and performance measures are in place to deliver efficient and high value services |
| Effectively managed multiple projects |
| **Interpersonal & Communication Skills** | Presents information in a confident, logical and convincing manner, verbally and in writing |
| Encourages open and constructive discussions around work issues |
| Promotes teamwork within the section, but also works effectively on projects across Departments/ Sectors |
| Maintains poise and control when working to influence others |
| Instils a strong focus on Customer Service in his/her area |
| Develops and maintains a network of contacts to facilitate problem solving or information sharing |
| Engages effectively with a range of stakeholders, including members of the public, Public Service Colleagues and the political system |
| **Specialist Knowledge, Expertise and Self Development** | Has a clear understanding of the role’s objectives and targets of self and the team and how they fit into the work of the unit and Department/ Organisation |
| Has a breadth and depth of knowledge of Department and Governmental issues and is sensitive to wider political and organisational priorities |
| Is considered an expert by stakeholders in own field/ area |
| Is focused on self-development, seeking feedback and opportunities for growth to help carry out the specific requirements of the role |
| **Drive & Commitment to Public Service Values** | Is self-motivated and shows a desire to continuously perform at a high level |
| Is personally honest and trustworthy and can be relied upon |
| Ensures the citizen is at the heart of all services provided |
| Through leading by example, fosters the highest standards of ethics and integrity |

**Software Development Manager - Key Achievements Form**

Having read the key competencies and having considered the demands of the role, for each of the competencies below, please briefly demonstrate a specific example which illustrates how you have developed the relevant competency during your career to date, and which clearly demonstrates your suitability for this position.

Your answer must highlight all elements of the STAR competency framework which is outlined below.

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| **S**ituation  | Present a challenging situation you found yourself in |
| **T**ask | What did you need to achieve from the situation?  |
| **A**ction | What action did you personally take to achieve this?  |
| **R**esult | What was the result of your action?  |

Please note, there is a maximum page count of **3 A4 pages at font size 10-12.**

The key achievements form commences on the next page.

**Software Development Manager - Key Achievements Form**

Please complete all sections of the form below.

**Where did you hear about this role (i.e. Publicjobs.ie, Irishjobs.ie, Irish Times, LinkedIn)?**

**Name:**

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| **Leadership** |
|  |
| **Analysis & Decision Making** |
|  |
| **Management & Delivery of Results** |
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| **Interpersonal & Communication Skills** |
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| **Specialist Knowledge, Expertise & Self Development** |
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