

IG

Irish Geography

MAY 2018

ISSN: 0075-0778 (Print) 1939-4055 (Online)

<http://www.irishgeography.ie>

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How to cite: O'Cionnaith, F. (2017) 'The 1783 Statistical Survey of Dublin's Street Network'. *Irish Geography*, 51(1), 93–114, DOI: 10.2014/igj.v51i1.1353



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The 1783 Statistical Survey of Dublin's Street Network

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First received: 9 October 2017

Accepted for publication: 4 April 2018

Abstract: Founded in 1774, the Dublin Paving Board was responsible for maintaining and improving the quality of the city's street network. By 1783, the organisation had amounted substantial debts resulting in significant political fallout concerning its governance. An interim committee, tasked with alleviating the situation, commissioned a statistical survey to better understand the state of Dublin's transport network, which at the time consisted of nearly four hundred streets, lanes and alleys. The survey was important for several reasons. In immediate terms, it was central to operational and financial planning of the Paving Board whose work affected the entire populace of Dublin. By categorising and assessing every street in Dublin, the survey empowered decision makers within the Board to determine the future of the organisation and how the city's streets should be managed. The survey was also of historical significance as it documented an important element of urban life in eighteenth-century Dublin free of bias or opinion that frequently shadowed the often-controversial work of the Paving Board in period publications.

Keywords: *Dublin, mapping, surveying, history, eighteenth century*

Introduction

Our miserable streets, the curse of their inhabitants, the laugh, the scorn of foreigners.

Anon., 1782, *Observations on the paving acts*. Dublin, p 3.

The status of Dublin's street system, lamented in the comment above, was an active political and economic topic in the early 1780s. Over the course of the eighteenth century, the city's population had greatly expanded, putting extensive pressure on the street network and those tasked with its improvement. Dublin in the 1780s was a substantial urban area within the context of the emerging British Empire. It had a population larger than that of the main North American colonial cities of New York,

Boston and Philadelphia combined, and was a major port in terms of colonial trade. It had grown over the course of the seventeenth and eighteenth centuries far beyond its original medieval walls, encompassing the surrounding area with suburban neighbourhoods and planned estates, the result of a considerable property development boom, practically all on the northern side of the river Liffey which divides the city. Home of the Irish Parliament, it was the centre of political life on the island and the focal point of a major part of Irish commerce and finance. A number of semi-autonomous organisations had been established to aid in Dublin's development. Their aim was to supervise various elements of urban improvement, often in cooperation with Dublin Corporation. This was an evolutionary era in city management with contemporary cities in Britain also undertaking similar approaches to creating overarching authorities responsible for urban development outside of the traditional medieval parish systems (Innes, 2001). The titles of these organisations were often self-explanatory, such as the Pipe Water Committee or the Wide Streets Commission, with the Dublin Paving Board being established in the 1770s to improve the quality of the city's streets and enforce ordinance related to their use. The modern city still feels the impact the establishment of such organisations brought to urban administration, though today, the tasks of such organisations exist primarily within the remit of local authorities. Eighteenth century interest in the development of transportation networks, in this case roads, is still applicable in the modern world. Projects such as the 1783 survey laid the foundation for studies still conducted today related to contemporary infrastructure improvement.

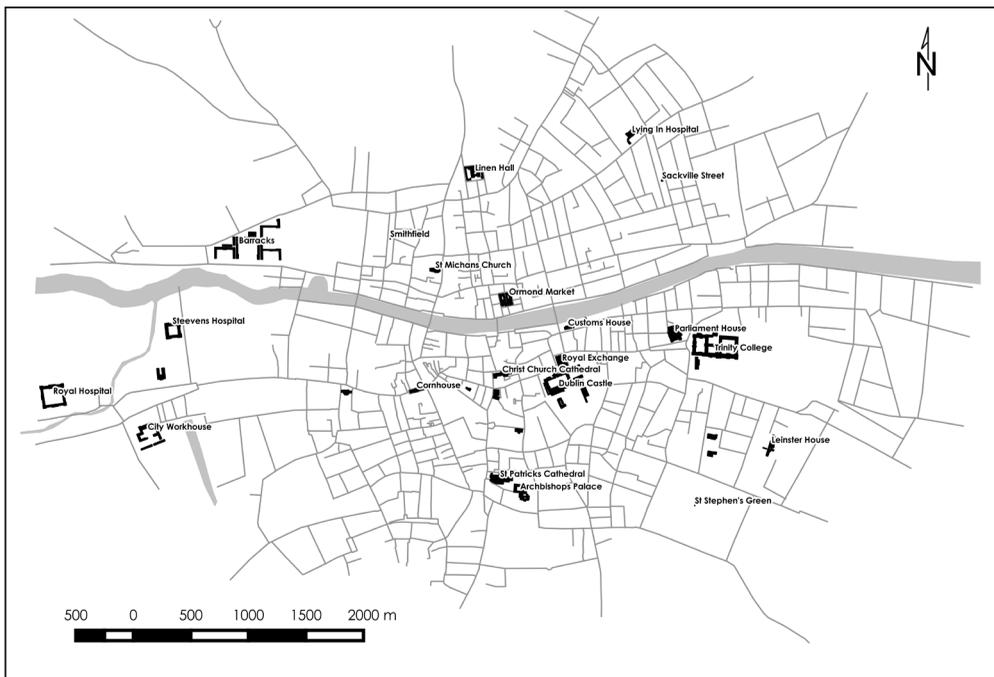


Figure 1: *Dublin in 1783*

Quality assessments of Georgian Dublin’s street network can be difficult to find from historical sources. Period publications mentioning the state of the city’s streets were often unduly influenced, either for or against, due to varied political standpoints, social opinions or publication objectives of authors of the era (Pool and Cash, 1780, p16).¹ Street quality is equally hard to assess from eighteenth-century maps such as John Rocque’s *An exact survey of the city and suburbs of Dublin* (Dublin, 1756) or the street scenes of artists James Malton (b. 1761, d. 1803) or Joseph Tudor (d. 1759), as such works did not actively focus on the street network and often sought to show the city in a positive, or at least partially sanitised light. The 1783 street survey of Dublin, conducted during a six-month period by surveyor Thomas Owen, offers an invaluable statistical record of nearly four hundred streets, lanes, courts, alleys, quays and yards along with descriptions of the variety of surface types and levels of street quality Georgian Dubliners experienced when navigating the city. The original survey resembles a ledger sheet, consisting of 391 entries related to individual streets.² It recorded each thoroughfare’s name, a written observation on the type of paving, if any, used, its quantity in square yards and if it was categorised as of primary, secondary or tertiary use to the city.³

58 19th April 1783

Names	Observations	Quantities	
	brought forward		
	brought forward	1999 6/4	%
Burgess Lane	Not formed - from the Haymarket to Brookwell Lane	235	1/2
Brown Street	ditto	630	
	from King Street to the Street		
Johnson Alley	ditto from Brown Street to both Street Street	235	
Cusack Lane West Side	ditto from Wallin Street to the Street	704	
Dale Lane	ditto	258	1/4
Hall Lane	ditto from Market Street to the Street	352	
Quinlan Alley	ditto	362	1/2
Letch Court	performed with black flags	322	1/2
	ditto of flags supposed to have been worn		
		23920	1/4

Second division

Names	Observations	Quantities	
	Principal Street having greatest wear		
Capel Street	formed with a Crown pavement	6577	1/2
Ormond Quay Upper	ditto that part in this division	227	1/2
	Lower Street pavement to the Street	3886	1/2
Bachelors Quay	ditto	4478	
Marys Alley	Crown pavement the part in the Street	1042	1/2
Marys Lane	ditto ditto	603	1/2
Marys Street	ditto	10000	1/2
Henry Street	ditto	2076	
Leah Street	ditto	1012	
Great Britain Street	Crown pavement including former ways to the Street	7229	1/2
	that part about the quay part of Street knights	5048	
Swifts row	Crown pavement	609	1/2
	brought forward	46203	1/2

Figure 2: Section of the 1783 Paving Board survey of Dublin, Paving Board Minutes, vol.11, p 58. Dublin City Library & Archive.

This paper reviews the circumstances that led to the survey's creation via a narrative history and the method under which it was recorded. An analysis on the overall condition and engineering sophistication employed in Dublin's street network is also undertaken by converting the original results into a geographic format through modern digital techniques.

Reasons for the Survey

The survey was commissioned by the Dublin Paving Board and was recorded in its minute book covering the period June 1783 to April 1784.⁴ The organisation, founded in 1774 by act of the Irish Parliament,⁵ was responsible for the maintenance of Dublin's streets, conducting repairs, improving paving quality and enforcing laws related to street usage such as traffic management and waste collection throughout the city. Many members of Dublin Corporation, including the Lord Mayor, were also members of the Paving Board, which prior to 1782 was in many ways an extension of the Corporation's authority. The primary reason behind the survey's creation was as a citywide stock-taking exercise, deemed necessary following a major financial scandal that engulfed the Board in the early 1780s (O'Cionnaith, 2015).

The Board was a controversial organisation from its inauguration as it removed Dublin Corporation's exclusive authority over the city's streets.⁶ However, as many of the original Board members were also sitting on the Corporation, some level of influence and guidance remained (O'Cionnaith, 2015). Under the Board's instruction, Dublin was divided into five administrative divisions of various sizes based on grouped parochial boundaries, with a sixth and a seventh division, the liberties of St Patrick's and Donore respectively, incorporated in 1776.⁷ Two divisions were north of the River Liffey; the remainder were to the south. Each was represented by a commissioner who in turn was supported by committees for each parish in their division. The creation of such administrative zones was an important step in the modernisation of street management in Dublin. The city's municipal requirements had grown substantially over the eighteenth-century and, with the exception of the semi-independent Dublin Liberties, by 1780, city management required consideration as a large cohesive urban unit rather than a series of separate parishes (McBride, 2009). Though parishes remained an important civic institute and service provider for Dubliners during this period, a disjointed parochial approach to the street network could have dire effects for the greater city:

It is in vain, that one parish repairs its roads, if its neighbours will not do the same; for neglect of any one part renders the whole impassable (Edgeworth, 1817, p 6).

Available income for street repair at a parish level could vary drastically (O'Cionnaith, 2015). The Paving Board's centralised approach meant, in theory, funds could be distributed to those areas of Dublin most in need of maintenance regardless of their local

financial resources. The Board was primarily funded by a paving tax, valued at 12 pence per pound of annual rent for houses and commercial premises or 4 pence per square yard for public or religious buildings, in the Board's jurisdiction.⁸ Tax revenue often proved difficult to collect with hostility and occasional violence greeting the Board's tax collectors on a regular basis. Gaps in the taxation fund were filled through bank loans, often far in excess of what the Board was capable of repaying (approximately £2,000 per annum). At the time of its founding, the Board received a loan of £5,000 by Irish MP David LaTouche Jr (b. 1726, d. 1816) which was followed in 1780 by two further substantial loans equating to £19,000.⁹

With such rampant borrowing, questions began to arise into the financial dealings of the Board, its perceived waste of public monies and potential irregularities related to its administrative practice. The matter was discussed in the Irish Parliament, based in College Green, a move much resented by both Dublin Corporation and a large portion of the city's populace, which saw interference from national government as unwelcome intrusion into the civic powers of Dublin's authorities. Members of the Paving Board protested at the 'most unjust charges without proof'¹⁰ in the Irish House of Commons, which had accused them of 'fraud, breaches of trust, and embezzling of the funds committed to their management'.¹¹ Protracted parliamentary debates, fuelled by wider political polarisation linked to period civil liberty issues,¹² ultimately led to the realisation that the Board could not continue in its existing format with such extensive debt. In August 1782, the Paving Board was annulled through parliamentary legislation and a second, reconstituted Paving Board was founded under new management.¹³ In order to better understand the street network it had inherited and assess the level of income necessary for its maintenance, this second Board commissioned the 1783 survey.

Street maintenance

A street network in constant use needs regular maintenance. For an organisation such as the Paving Board, understanding where its limited resources were most needed, or could be best deployed for greatest impact, was an important factor in its long-term operational and fiscal planning. This was especially true for the second embodiment of the Board, which faced the challenge of inheriting a system that had been financially unsustainable while also providing a service very much in public view.

From an engineering perspective, there are three primary issues that affect street maintenance: foundation stability, surface material, and traffic type. These three issues were relevant in the eighteenth century, as indeed they are today. Each has its own unique set of parameters, which, if applied incorrectly, can significantly reduce street quality. The principal reasons for the 1783 survey were to help the new set of commissioners understand the existing condition of Dublin's streets, and to identify where problems could occur.

One of the most frequently emphasised aspects of street construction found in period engineering treatises was the importance of a solid foundation, both for paved and unpaved streets (McAdam, 1819, p4; Law, 1855, p19; Conchon, 2006).¹⁴ If foundations

were poorly laid, were exposed to water or to excessive weight from traffic, substantial subsidence could occur. This was the case of High Street, Dublin, which in 1774 was described as being unpassable in parts due to a 'chasm' opening:

... [to] the immediate danger of foot passengers; the detriment and injury of the industrious shop-keepers and the stoppage of trade in one the of principal thoroughfares of this metropolis.¹⁵

Foundations were protected by the material used to ensure a solid and hard street surface, which varied immensely in this pre-Macadamised era. In England, one author noted twenty-one kinds of street paving materials in use, mostly dependant on local resources, while another described the job of listing all paving types then in use as 'an endless task' (McAdam, 1816, p7). For major thoroughfares in Dublin, the Paving Board made extensive use of granite supplied by a number of quarries based in Wicklow and Guernsey¹⁶ but were not beyond recycling old paving materials, which it kept at a number of storage yards throughout the city (Hall and Freeman, 1826, p. 5). This method, though not ideal, was also used in contemporary Paris.¹⁷ Paving was significantly less common on Dublin's back streets, which were often surfaced with compacted gravel. As a surface material, gravel had limitations. If too large a pebble size was employed, it could be easily displaced by vehicle traffic and wear thin in areas of frequent use.¹⁸ The various surface types used in Dublin, along with their distribution around the city, were of particular note for the survey and are discussed further below.

While vehicular traffic in Georgian Dublin was miniscule compared to the quantity and tonnage seen in the twenty-first century, carts, drays and carriages played an important role in road surface damage. A prevalent point found in period road treatise, and often mentioned in Paving Board legislation (Blaquiere, 1786, p. 59)¹⁹ was the wheel width of vehicles. Heavy loads carried on narrow wheels exerted greater pressure on street surfaces, leading to a rapid deterioration of surface quality (Bourn, 1763, p4).²⁰ Stage coaches, which by design had narrow wheels and moved at great speed compared to other road traffic, were a prominent problem²¹ as, generally, wheels greater than three or four inches broad were preferred by local authorities (Evans, 1836, p. 201).²² For very heavy vehicles, one period author recommended that front and back wheels should be offset slightly, to not run in one track, thus reducing surface wear.²³ Damaged street surfaces caused by vehicles were also noted as creating more noise, being a potential source of injury for horses (Parnell, 1833, p137) and caused much discomfort to passengers, particularly those travelling in narrow wheeled carriages:

The narrow [wheel] feels every crevice, sinks into the minutest hollow which is the cause of that jolting, tottering motion, which not only further damages the road but the carriage too; and also very much retards and deadens its progressive direction.

But when wheels are very broad, they move along with a more firm and steady pace; pleasant to the cattle, easy to the carriage, beneficent to the roads, and speedier in their progress²⁴.

Whether streets consisted of paved stones or compacted gravel, their maintenance continued *ad infinitum*. The 1783 survey was central to the Board's future planning and, when coupled with the organisation's financial accounts, became both a status report and action plan for the improvement of Dublin.

Conducting the survey

The second Paving Board's inaugural meeting was held in early August 1783.²⁵ Critical to this new Board's inception was to examine the work of its predecessors. A brief review of the first Board's accounts made it abundantly clear that it had left substantial debt (approximately €3.3m when converted to 2017 currency), which was accompanied by extensive levels of repayment interest.²⁶ However, outside of financial planning, the state of the city's streets also required assessment before future development could be agreed.

One of the first official requests of the new Board was to its surveyor, Thomas Owen (d. 1788), to give his view on the city's respective divisions and the most necessary work to be conducted in each. Owen, an architect and measurer,²⁷ had been employed by the first Paving Board since its founding in 1774. His immediate assessment to the new regime was brief, listing only a few streets in each division that required attention or were in need of urgent repairs. However, this was insufficient for the Board and it subsequently requested its commissioners to 'perambulate their divisions', accompanied by Owen, to conduct their own observations. Information returned to the central Board following this appeal varied immensely. The commissioners and committee representing the fourth division, centred around Christchurch Cathedral, for example, submitted a detailed appraisal, noting the state of several streets and both the time and costs they believed it would take to bring them back to a state of repair.²⁸ Their colleagues in the first and third divisions, located in the north west and south east of Dublin respectively, however, simply sent their local supervisors to undertake the inspection with significantly less detailed results. The supervisor in the third division, in particular, noted only two streets requiring attention and did not return a cost or time assessment but took effort to inform the Board that he required a new stable for his horse.²⁹

Parochial grievances and local needs would invariably skew any assessment conducted by divisional staff. The Board consequently asked Owen to undertake a more detailed and citywide review of the condition of Dublin's street network:

Ordered unanimously that the surveyor do lay before the Board on the first meeting in January next [1783], the number of square yards of pebble pavement in each division, specifying the number of square yards in each street, and the price per square yard that would be sufficient for new pebble pavement in each

division; & also the price per annum per square yard that would be sufficient to keep each street in good order, in repair for seven years.³⁰

When questioned if this task was feasible, Owen replied that it would be impossible to achieve this goal working by himself and required funding for an assistant to 'measure & calculate the measurements of the different streets, & also men to carry the [measuring] rods', being awarded £34 for the task³¹. The rods used to undertake the survey were basic graduated tools used in place of a surveyor's chain to calculate lengths and area. The exact size, material and deployment of Owen's rods were not recorded by the Board. However, such instruments were widely used in measuring work throughout the era and were a logical choice given that the Board was only in need of a tabular list of streets with corresponding areas rather than a cartographic product.

Owen was unable to meet the initial January 1783 deadline. By March, he reported to the Board that it was 'more difficult than he apprehended' listing bad weather over winter along with his usual duties as impeding his progress, suggesting May as a more achievable goal.³² The survey was a sizable task for Owen who had no experience in such large-scale measurement projects and was perhaps beyond his project management skill. He also could not be considered an exemplary employee, having been reprimanded, though retained, on previous occasions. At several points in the survey, there were suspiciously repetitive street descriptions, often grouped though not by geographic proximity, which perhaps may suggest he was simplifying results to speed the project up. Another sign that Owen was struggling was that he was often unavailable to conduct his usual duties during the survey period despite his earlier protestations that they were being done simultaneous to the survey.³³

Owen, along with each division's supervisor, returned preliminary results in early May as promised. However, they were sparse in specifics. The results gave square yards for each division, rather than for individual streets, and were approximately 20% overestimated when compared to the completed 1783 survey. Of the six Paving Board divisions, only two returned assessments of finances required for long-term street maintenance.³⁴ The Board was disappointed with these results as they had hoped to use the figures from this information to agree contracts for paving work, delaying this action until Owen's full street survey was submitted in September 1783, nine months behind schedule.³⁵ Despite its late submission, Owen's tabulated survey offered a level of detail more than adequate for the Paving Board's needs.

Transformation to cartographic model

To allow greater analytical depth in this paper, the tabular 1783 survey was converted into a spatial environment by joining it with a digitised GIS model of Dublin's late eighteenth-century street network. The use of a spatial database of Dublin in the 1780s was considered a key to understanding both overall and localised patterns in the street network. Indeed, it is interesting to note that no attempt was made by the Paving Board

to convert the statistical survey into a map format at the time unlike their counterparts at the Wide Streets Commission who left an extensive cartographic record.

As mentioned above, the Paving Board's survey was tabular, with streets grouped by their perceived level of use rather than their location in respect to each other. As such, it is difficult to obtain a clear picture of the make-up of the street network throughout the city by directly reading the survey. Therefore, a GIS model was considered an appropriate and logical method in order to analyse the condition of the city in 1783. The detail model consisted of the centre line of Dublin's streets, digitised from period mapping and joined to the Paving Board's survey using original street names, many of which have changed radically over the centuries, particularly after independence in 1922. The basis for this digital street network was Rocque's 1756 survey of Dublin, which proved sufficient for the majority of the city given its high level of detail. It was of particular use when identifying smaller yards, lanes and alleys, compared to generic street maps found in directories contemporary to the 1783 survey.

The three decades separating Owen and Rocque's work saw Dublin's urban area expand and change, requiring additional sources to support the digital network and reflect Dublin's streetscape in the early 1780s. Many street names were found to have been altered between the two surveys, with older, rustic names often replaced with more genteel ones, in a form of eighteenth-century urban gentrification. Frequently, street name changes came about through the work of the Wide Streets Commission, founded in 1757 with the responsibility of opening Dublin's thoroughfares and modernising the city's overall look (McParland, 1972, p. 5; O'Cionnaith, 2012; O'Dwyer, 2002; Sheridan, 2001, P. 66). Indeed, one complaint levelled against this organisation at the time was that much of its focus simply involved altering street names which 'were too vulgar for pronunciation, and scarcely to be articulated without the risk of breaking gentlemen's teeth'³⁶ rather than proceeding with the complicated legal, financial and engineering work of altering Dublin's layout. Notable name changes identified during the course of the research include Dunghill Lane becoming Island Street, Cow Lane to Greek Street, Worlds End Lane to Montgomery Street and Great Boater Lane to Bishop Street.

To further supplement the digital Rocque street network and to identify streets whose names had been altered or new streets added since 1756, additional cartographic and non-cartographic sources were consulted (Wilson, 1798; Goodbody, 2008).³⁷ Of particular use was C.T. McCready's *Dublin Street Names* (Dublin, 1892) which charted changes in street names variation throughout the city over time. Through these combined methods, 94.4% of all streets listed in the 1783 survey were plotted, equating to 98.3% of total square yards within the Paving Board's jurisdiction. The remainder consisted primarily of small lanes and alleys listed under informal local or family names located in the medieval core of the city.

1783 survey results

As noted above, the 1783 survey listed Dublin's streets categorised by their level of usage, sorted by division. Within each category, there was no set order for street listing, either alphabetically or by quantity. An 'observation' was provided for each entry related to its surface material, drainage system or occasionally, for smaller lanes and alleys, its location. A figure in square yards was included for each entry, allowing the Dublin streets to be reviewed from both qualitative and quantitative perspectives.

This section reviews the street survey results, projected onto a map of Dublin's eighteenth-century street network, under several separate statistical aspects.

Street area (Yardage)

For the Paving Board, each street's square yardage was a key figure from an operational and financial standpoint. When paying paving contractors for their work, the Board would examine the number of square yards of paving laid, with contractors being awarded proportionately.³⁸ In Owen's survey, a yardage figure was supplied for each street, grouped per division, allowing the Board to determine the financial requirements needed in each. For modern researchers, this figure also provides greater insight into the Board's complex divisional layout and share of street area. Division borders altered over

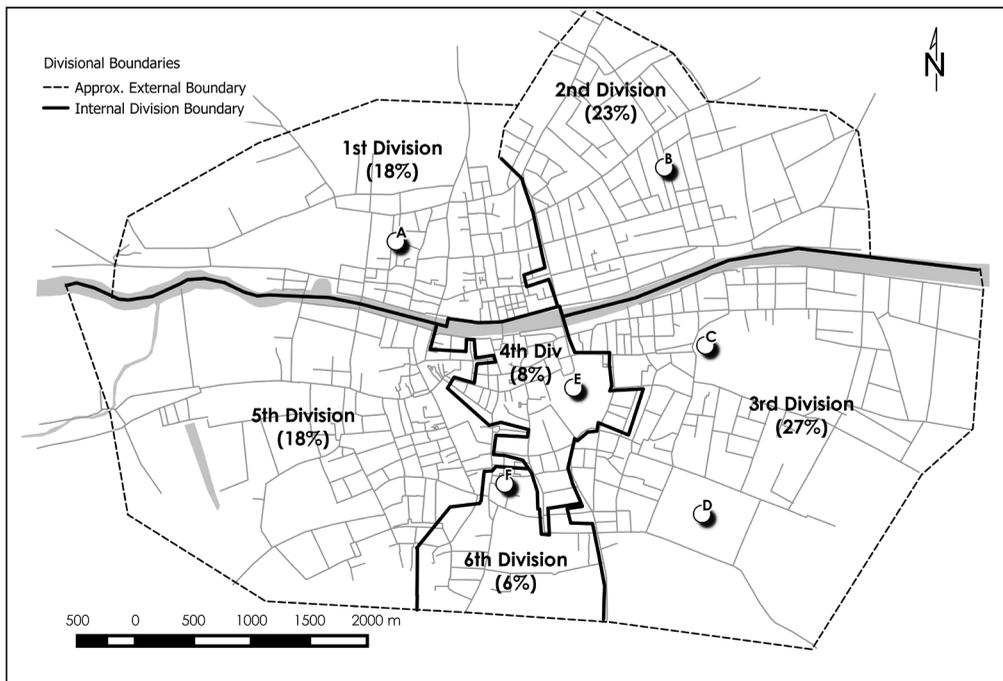


Figure 3: Percentage share of square yardage share per division. Circled reference points (a) Smithfield; (b) Sackville (O'Connell) Street; (c) Trinity College; (d) St Stephen's Green; (e) Dublin Castle; (f) St Patrick's Cathedral.

time, often due to operational necessity. Thus, the survey gives a relatively precise picture of the divisional design in 1783, which is difficult to identify from other sources.

When Dublin's 1783 street yardage was assessed (see Figure 3), the eastern divisions, namely the second and third, accounted for 50% of the total area within the Board's jurisdiction. The fifth division, despite its large physical size, still contained significant areas of semi-rural land, thus limiting its share to 18%, while the medieval core of the city, covered by the fourth division, accounted for only 8% of all yardage, demonstrating how far beyond the old city walls Dublin's street network had grown.

Street Categories

The Board's logic for categorisation lay in the perceived level of usage and/or economic importance to the city of each street. Three categories were used for the survey:

- 'Principle streets supposed to have the greatest wear.' (primary)
- 'Streets supposed to have a lesser degree of wear.' (secondary)
- 'Streets supposed to have least degree of wear.'³⁹ (tertiary)

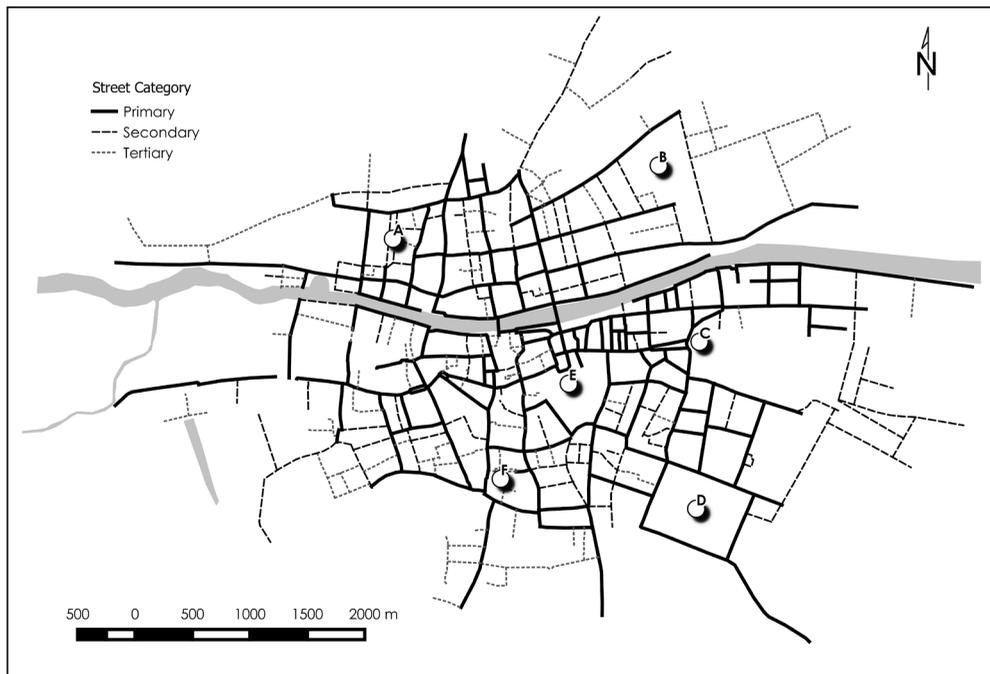


Figure 4: Classification of Dublin's street network, as recorded in the 1783 survey. Letter markers as per Figure 3.

When viewed from an overall city perspective, Dublin's street network appears to have been in heavy use with the primary category accounting for 56.8% of all surface area. Primary streets were main roads, generally wider than secondary or tertiary streets, with high levels of traffic. These streets were found throughout the city and many of them, such as Dame Street, Thomas Street and the Liffey Quays, are still significant to modern Dublin transportation. Other areas considered important in eighteenth-century Dublin, such as the Temple Bar area, have lost most of their vehicular traffic and comparatively recently have become pedestrianised. Amongst the Board's administrative regions, the third division lay to the southeast and outside of the medieval core. It covered a physically large area and primarily consisted of planned streets. This region accounted for a 34% share of all primary street yardage in Dublin, comprising 71% of the division's total network. Overall, Dublin's primary street network was more developed on the southside of the city with southern divisions consisting of both a greater average share of primary streets yardage within their own borders (65% average) and in total of the city at large (69%) compared to their northside equivalents (44% average per division/ 31% overall city).

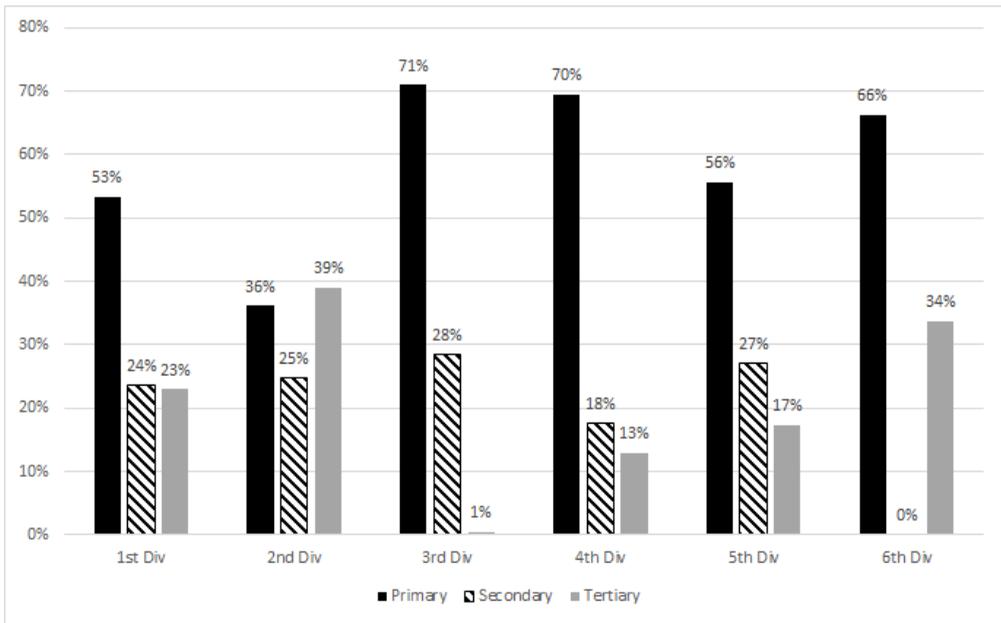


Table 1: Structure of each Paving Board division based on street category.

Secondary streets were of lesser importance to both commerce and transport, often surrounded by primary routes. Most secondary streets were located away from the Liffey on the southside, with few found closer than half a kilometre from the river, possibly indicating the important connection found between Dublin's maritime trade

and the street network on the southern side of the city. The same category was located throughout the northern divisions, although with no discernible pattern, and included several thoroughfares now considered vital to Dublin's street traffic, notably Dorset Street and Gardiner Street. Again, as with primary streets, the third division contained the highest proportion in the city (32% of overall city total), attributable to its large size, with distribution of this category north and south of the Liffey being proportional to their respective street yardage share (41% northside, 59% southside). Within individual divisions, secondary streets comprised an average of 24.4% of streets with the exception of the sixth division where only primary or tertiary categories were noted.

Tertiary streets consisted of yards, laneways and alleys, residential or semi-rural roads, all of which supported little traffic on a daily basis. The vast majority of Dublin's tertiary streets were located on the northside of the river, with the first and second divisions accounting for 66% of the city's total yardage. The city's southern divisions saw significant disparity in their tertiary content with 34% of the sixth division falling within this category compared to 13% and 17% in the fourth and fifth divisions and a meagre 1% in the third division. The third division's lack of tertiary streets appears unusual, considering the widespread distribution of this category throughout the rest of the city (see Table 1). Possible sources of lower tertiary numbers in this division could lie in a cluster of streets (Gloster, Hanover and Sandwith Streets) excluded from the survey, perhaps in error by Owen, the planned nature of the newer Georgian neighbourhoods in this division, and the substantial areas of the division covered by St Stephen's Green and the lands of Trinity College.

Areas outside of the Paving Board's jurisdiction

One aspect revealed by analysis of divisional areas was the identification of streets outside of the Paving Board's jurisdiction (Figure 5). These areas, not considered in the 1783 survey, were scattered throughout the city and were excluded for a variety of reasons. Many were located around Dublin's periphery, especially to the west of the first and fifth divisions. These regions fell outside the city limits and, thus, were considered part of county Dublin and outside of the Board's control. As the city grew, so did the Board's area of administration. The city boundaries at the time of the survey were poorly defined in period mapping. However, by the late 1790's, the Board's jurisdiction had expanded to the North and South Circular Roads, thus including many of the outlying streets excluded in the 1783 survey.⁴⁰ Within the city, Ormond Market was notably excluded, as were a large number of narrow alleys, yards and lanes. Many of these laneways, particularly in the third division, were for stable access only or were considered private property, thus falling outside of the Board's authority.⁴¹

Large areas of the second division were omitted from the 1783 survey, mostly falling within the residential Gardiner estate. This area of the city was developed under successive generations of the Gardiner family, and, at the time of the survey, was under the remit of Luke Gardiner, 1st Viscount Mountjoy (b. 1745, d. 1798). Two years before the first Paving Board was formed, legislation was passed entitling sections of this estate,

such as the major thoroughfares of Sackville and Marlborough Streets, to attend to their own street paving and maintenance needs. Complete with their own commissioners, these micro-Paving Boards had full authority to conduct works on their respective streets, hire workmen and conduct improvements to make the area ‘...most commodious to the inhabitants...’⁴² Again, as the city grew over the coming decades, these areas would fall under greater influence of the central Paving Board.

Another area at the edge of the city, notably absent in the survey, was the liberty of Donore. The Dublin Liberties historically held special dispensation to enforce their own laws and civil management due to their medieval foundation as ecclesiastical sites, separate from the authority of Dublin City (Milne, K., 2009, p.37). Throughout the history of the Paving Board, these liberties were often considered a substantial financial drain on the organisation due to their low level of paving tax income but poor quality street network.⁴³ Street services in the liberties of Donore and St Patrick’s came under control of the Board in 1776 as its seventh division. However, by the early 1780s, Donore had left the Board’s jurisdiction, resulting in its exclusion from the 1783 survey.⁴⁴ The second Board noted, however, that the seventh division still owed several hundred pounds in outstanding paving taxes, even though it had been removed from the jurisdiction.⁴⁵

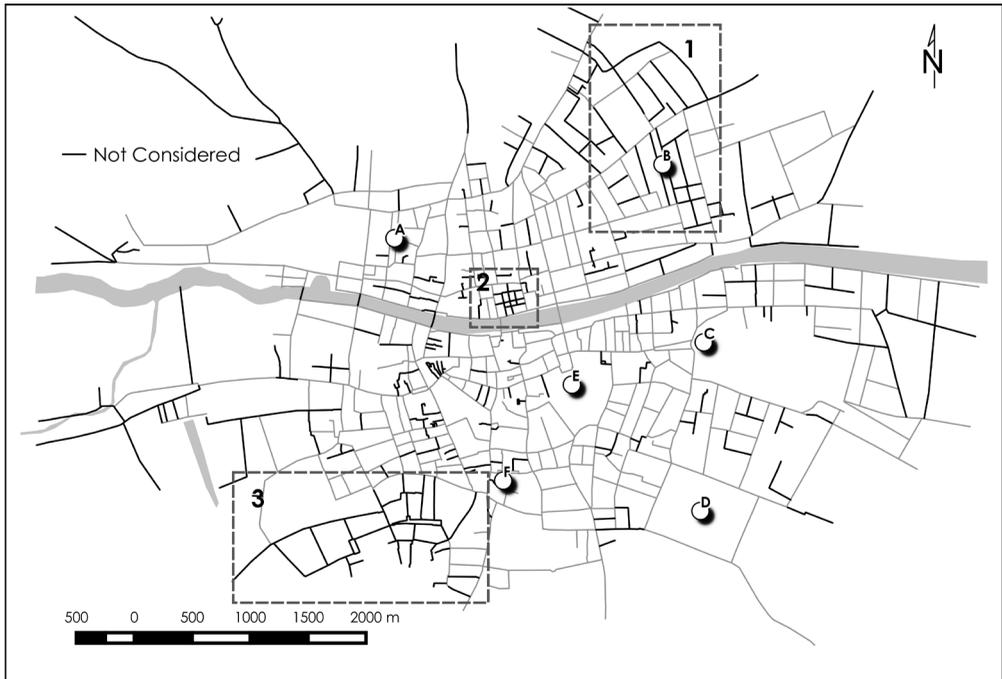


Figure 5: Areas of Dublin not included in the 1783 Paving Board street survey. Highlighted areas are 1: Gardiner Estate; 2: Ormond Market; and 3: Liberty of Donore. Letter markers as per Figure 3.

Street surfacing

The materials and techniques used to pave Dublin's streets, regardless of their classification, were diverse, occasionally haphazard and deployed to various degrees of engineering sophistication. A total of fourteen street surface types were recorded across Dublin in 1783 (see Table 2). Though many surface types were relatively similar in form, the two most frequently found throughout the city lay at opposite ends of the engineering spectrum, namely 'crown pavement' (50.7% of all yardage) and 'not formed' (20.5%).

Crown pavement consisted of paving blocks laid and graded so that the central portion of the street is higher than the edges, i.e. crowned, thus allowing water to run off to side drains.⁴⁶ This pavement type was the most sophisticated form of street surfacing recorded during the 1783 survey and represented a significant investment for the Board in both terms of expenditure and engineering. Paving blocks used for crown-paved streets were rectangular, similar in size to cobbles (if not in shape) and narrower than paving slabs used for footpaths to allow for vehicle weight to be absorbed by several blocks at once, thus reducing excessive damage to individual blocks. They were set on a prepared bed of gravel by a paver striking the block with a wooden maul, which was then surrounded by mortar to help fix the block in place⁴⁷ with granite being the preferred material.⁴⁸ Significant care was required to ensure that all paving blocks were set at an even height as exposed blocks reduced the street's overall smoothness and would be damaged at a faster rate by passing vehicles (DeWitt Bloodgood, 1838, p. 25).⁴⁹ Therefore, it was necessary to inspect a newly paved street for several months to identify paving blocks that had not settled correctly.⁵⁰ To increase the road surface lifespan, loose gravel was also occasionally placed over crown-paved streets in Dublin⁵¹ with crown streets being flanked by curbs intended to protect footpaths from wheel damage and to provide runoff water a clear channel.⁵²

Crown-paved streets were found throughout Dublin in 1783 and were the most common street surface type in all but two of the Paving Board's divisions (see Table 3). However, their frequency amongst Dublin's street categories varied. Primary streets across Dublin were overwhelmingly paved (67%), reflective of their importance to commerce and transport. The city's secondary network possessed a significantly lower share of crown-paved streets (39%) while the tertiary network was rarely paved (16%). Given the time and money required to construct crown streets, the Board's attention to the primary network was operationally sound, as they would be of greatest use to the majority of people. Unfortunately, one item not recorded in the 1783 survey was the state of repair of crown-paved streets. Thus, while this surface category can be quantified on a divisional or city basis, there is no means to qualify the level of upkeep of these streets.

At the opposite end of the technical sophistication were unformed streets. Unformed streets (recorded as 'not formed' in the survey) were located throughout Dublin, mostly in the secondary and tertiary networks. These streets lacked the investment seen in their crown-paved equivalents. They usually consisted of compacted gravel, with little or no separation between street and footpath and most lacked features or levelling to aid with water runoff. While unformed streets were cheaper to build, they required more

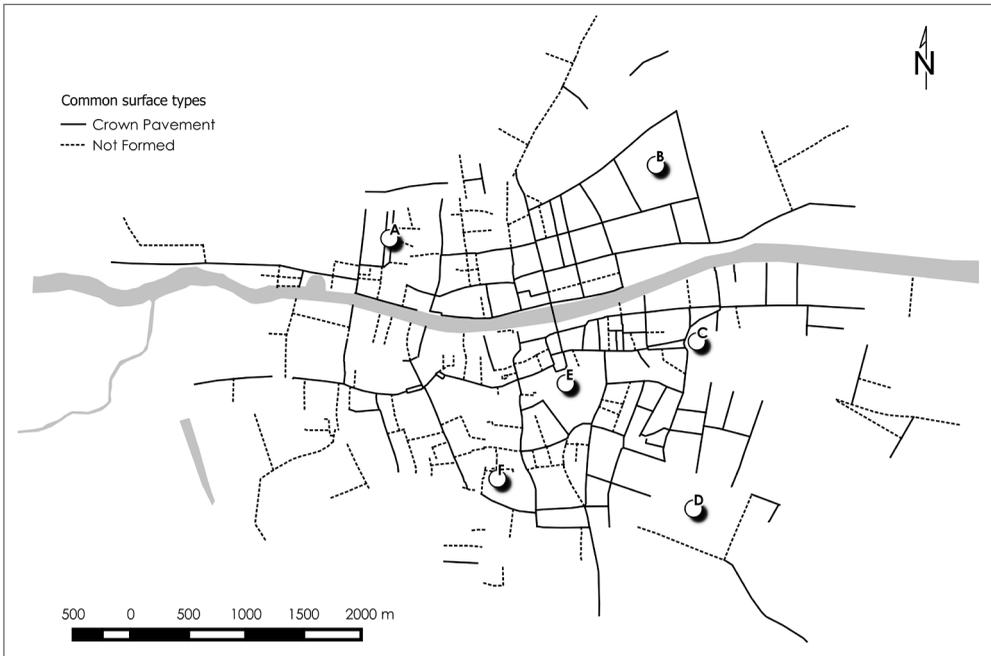


Figure 6: Distribution of 'crown pavement' and 'not formed' streets across Dublin. Letter markers as per Figure 3.

maintenance than paved streets due to the materials used in their construction. One example of problems arising from the use of gravel as a street surface was the shape and size of the individual stones used. As gravel is round, direct vertical pressure from vehicles causes unsecured stones to move, eventually leading to ruts appearing in the street surfaces.⁵³ Though giving the impression that the gravel had worn away due to traffic,

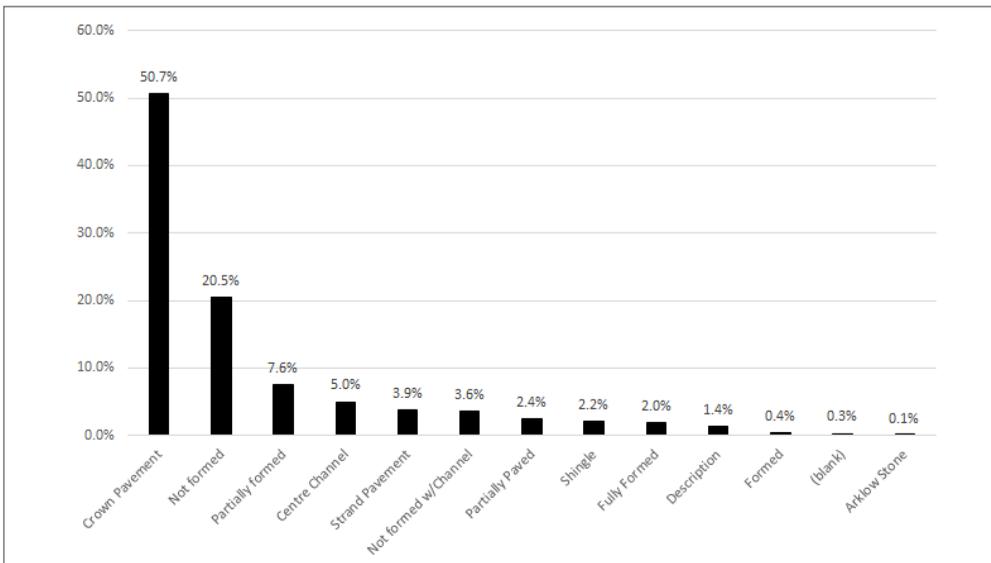


Table 2: Incidence of road surface types across Dublin as recorded in the 1783 survey

the stones had in fact become loose and moved to the side of the street through the action of vehicles riding over them, thinning the surface in the parts most traversed.⁵⁴ Pebble sizes in period road construction could also vary widely leading to an uneven surface, with larger stones taking greater wear, resulting in an uneven degradation in a street's surface.⁵⁵ John McAdam, the developer of the macadamised road in the nineteenth century, strongly argued for engineers to pay greater attention to the key point of gravel size during road and street construction:

The materials of which a road is to be composed, should be reduced to such a size as shall enable carriages to pass over, without striking against them, so that they may be consolidated by a perpendicular pressure [by vehicles] ... when the stones of a road exceed the size of [1 inch] bearing, the wheels of carriages will keep them in constant motion and prevent their consolidating.

The use of uniform small gravel stones could be of great advantage for street surface development. In the early nineteenth-century, the Paving Board, under the instruction of Board director Major Alexander Taylor (b. 1748, d. 1828), used small-sized gravel stones which were first laid and then compacted by passing vehicles over several months to create a solid foundation for future crown paving. This method was widely employed across Dublin and was praised by both fellow directors and foreign commentators. However, it was not utilised during the time of the 1783 survey.⁵⁶

Unformed streets accounted for approximately 25% of street surfaces across the Board's divisions (see Table 3), with the vast majority found in Dublin's secondary (46%) and tertiary (42%) networks compared to its primary one (8%). Around 12% of all unformed streets in the survey were recorded as having channels or drains running along their axis, thus allowing water run-off. The fact that this form of drainage was

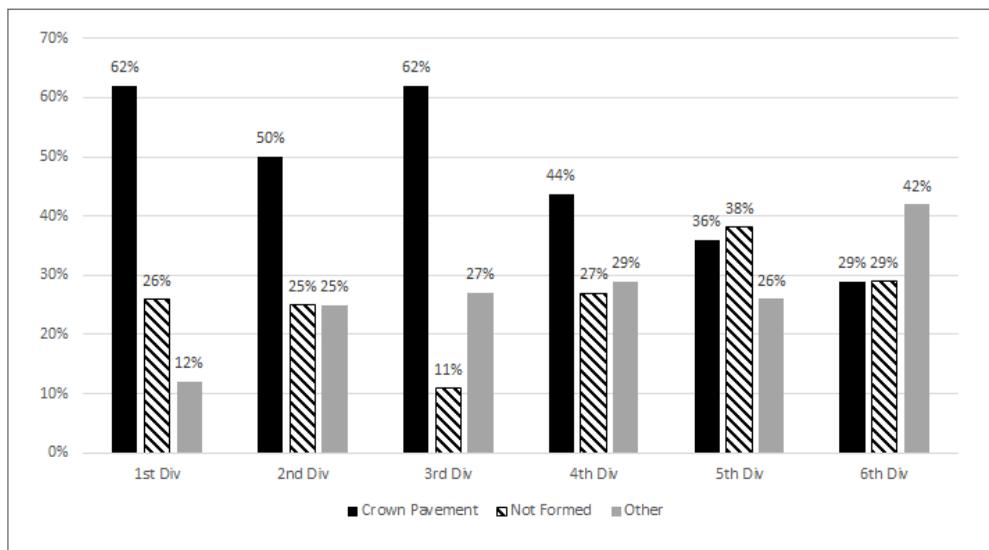


Table 3: Assessment of each Paving Board division based on road surface type

of note to Owen during the survey, and that it accounted for a very low proportion of such a common street surface type, indicates that the city's lesser streets may have had significant issues with surface water during periods of bad weather.

The remainder of street surfaces identified fell between the high-end crown or lower-end unformed streets, represented by the 'other' category in Table 3. These streets comprised approximately 25% of all street yardage across Dublin. However, their concentration varied on a division-to-division basis. In 1783, many of these streets were in the process of being improved, with the survey distinguishing streets that were partially paved,⁵⁷ had alternative paving stone types,⁵⁸ were fully or incompletely formed, i.e. roadway with footpaths⁵⁹ or contained basic drainage.⁶⁰ Descriptive locations were provided for seventeen small streets in the 1783 survey, mostly part of the tertiary network in the labyrinthine fourth and fifth divisions. These explanations usually identified what main street these smaller streets, lanes and alleys intersected or joined, e.g. 'Fishers Alley – from Winetavern Street to Wood Quay'. However, such notes replaced what would normally have been a surface type assessment, thus leaving their state of development unknown.

One notable street surface type missing entirely from the survey was wood. Wood was employed to deaden street noise, such as the fall of horses' hooves, and was used in proximity to hospitals, churches or schools (O'Brien, 1982, p66). The hexagonal blocks at the front entrance of Trinity College are rare examples that survive to this day. The 1783 survey appears to pre-date the use of this material as a road surface in Dublin which, though difficult to maintain in wet conditions,⁶¹ was widely utilised in period Russia and North America and grew in popularity in the city during the nineteenth-century.⁶²

Impact of the 1783 survey on the Dublin Paving Board

When Owen's street survey was returned, the Paving Board was in a position to compare its results against the organisation's internal accounts. By the winter of 1783, the Board had a substantially better operational and financial overview of street maintenance required in Dublin. The results were not positive. Though many of Dublin's streets were well paved, there was still substantial work required, both to maintain the existing network and develop unpaved streets. The debt created by the first Paving Board's rampant borrowing was found to greatly outweigh the amount of paving tax income the Board could raise and, while this debt could be controlled, it meant that street maintenance across the city, quantified by Owen, had to be delayed or halted with:

... the second division being unable to carry out any work for fifteen months to come; the sixth division for the better than two years, & the first & third [divisions] not a fund sufficient to make necessary repairs ...⁶³.

Such a halt was unacceptable. The Board was very clear on where the problem had stemmed, noting that its predecessors '... which having power to borrow money, carried on their works with such rapidity, as forced them to accumulate a debt, that has involved

this corporation in its present distress.⁶⁴ With no definitive record of the condition of the city's streets prior to the founding of the first Paving Board in 1774, it is impossible to ascertain to what level the high frequency of crown-paved streets documented throughout Dublin in the survey had helped cause the organisation's financial crisis. However, it could be safely estimated to have been considerable. Comments on the second Board's work had begun to appear in the media, with one contributor noting that the state of Dublin's streets had 'of late become objects of national concern' and that 'we cannot avoid thinking that mismanagement lies somewhere.'⁶⁵ Though the Board was still actively seeking tax owed from the populace, without urgent financial aid from the Irish Parliament, its operations would halt while the interest on the loans would only increase.⁶⁶

The second Board continued functioning until April 1784 when it was dissolved by a new paving, cleansing and light bill.⁶⁷ Its replacement, the third Paving Board, consisted of a small group of commissioners and directors, controversially unelected and entirely outside of the control of Dublin Corporation.⁶⁸ The Corporation would not fully regain authority of the city's streets until 1849.⁶⁹

Conclusions

Referring to the quotation at the beginning of this paper, was it a correct assessment that Dublin's streets were miserable, a curse and deserving of scorn? With its mixture of Georgian, Tudor and Medieval planning, it was impossible, in 1783, to have universal high quality street paving on the complex network of Dublin streets. However, as evident, a significant portion of these streets were either paved, suitably surfaced or contained features to aid with waste water management to conclude that Dublin's overall street network was in good condition, at least on paper.

Street surface quality varied across the city, mostly dependant on the level of road usage but also affected by where streets were located. Significant divergence in street surfaces existed between the primary, secondary and tertiary networks to conclude that paving focus was directed towards thoroughfares of greatest use to the majority of the populace, with a noticeable east/west deviation amongst divisions.

While the level of repair of each street was not recorded by Owen during the survey, the classification and quantification of surface types was of sufficient detail for the Board to calculate medium- to long-term financial planning for both maintenance and expansion of the paving network. Further investigation into the work conducted by the first Paving Board between 1774 and 1783 is hampered as no initial survey was conducted at the commencement of their duties, thus removing the ability to chart the development of the paved network in Dublin over the tenure of the first Board.

The 1783 survey was a logical undertaking implemented by the second Paving Board to fully comprehend the requirements asked of it. The survey's results confirmed that the task of maintaining Dublin's streets was beyond the resources assigned to the Board and, ultimately, led to its demise. Outside of its immediate use to the Paving Board, the survey's lasting legacy is as a document that provides unprecedented insight into an important aspect of life in Georgian Dublin.

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Endnotes

- ¹ *Freeman's Journal*, 1774. 29 Sept.; *Freeman's Journal*, 1782. 12 Mar., Anon., *Observations on the paving acts*, p. 9.
- ² Dublin Paving Board minute book, 19 Sept. 1783 (DCA, PB/Mins/11, p. 55).
- ³ *Ibid.* Primary referred to as 'Principle streets supposed to have the greatest wear', secondary referred to as 'Streets supposed to have a lesser degree of wear' and tertiary as 'Streets supposed to have the least degree of wear'.
- ⁴ Dublin City Archives, Paving Board minute book vol. 11 (PB/Mins/11, pp. 55-70).
- ⁵ 13 & 14 Geo. III, c.20 [Ire.] (1774)
- ⁶ *Leinster Journal*, 1774. 11 June.

- ⁷ 4 Apr. 1776 (DCA, PB/Mins2, p. 55).
- ⁸ *Ibid.*
- ⁹ *Ibid.*, p. 36. Approx. €2m when converted with the LaTouche loan being just over €500,000.
- ¹⁰ 2 Mar. 1782 (DCA, PB/Mins/9, p. 234).
- ¹¹ 4 Mar. 1782 (DCA, PB/Mins/9, p. 237).
- ¹² *Freeman's Journal*, 1782. 12 Mar. The early 1780s witnessed increased discord from liberal Irish MPs seeking further repeal of the restrictive Penal Laws and greater independence of the Irish Parliament.
- ¹³ 7 Aug. 1782 (DCA, PB/Mins/10, p. 3).
- ¹⁴ Edgeworth, R.L., 1817, *An essay*, p. 24
- ¹⁵ *Freeman's Journal*, 1774. 29 Sept.
- ¹⁶ 1 Sept. 1785 (DCA, PB/Mins/16, p. 34) [Guernsey]; 6 Dec. 1784 (DCA, PB/Mins/13, p. 176) [Wicklow].
- ¹⁷ Law, H., 1855, *Rudiments of the art of construction*, p. 119.
- ¹⁸ McAdam, J., 1819, *A practical essay*, p. 5.
- ¹⁹ 13/14 Geo. III c. 32 [Ire] (1773-74); 17 Geo. III, c.10 [Ire] (1777-8); Tues 31 Jan. 1786.
- ²⁰ Edgeworth, R.L., 1817, *An essay*, p. 23.
- ²¹ McAdam, J., 1816, *Remarks*, p. 12.
- ²² Edgeworth, R.L., 1817, *An essay*, p. 23.
- ²³ Evans, W., 1836, *A treatise*, p. 201.
- ²⁴ Bourn, D., 1763, *A treatise upon wheel-carriages*, p.4.
- ²⁵ 7 Aug. 1783 (DCA, PB/Mins/10, p. 3).
- ²⁶ 28 Oct 1782 (DCA, PB/Mins/10, p. 96).
- ²⁷ 29 June 1774 (DCA, PB/Mins/1, p. 10).
- ²⁸ 6 Sept. 1782 (DCA, PB/Mins/10, p. 33).
- ²⁹ *Ibid.*
- ³⁰ 6 Sept 1782 (DCA, PB/Mins/10, p. 32).
- ³¹ *Ibid.*
- ³² 28 Mar. 1783 (DCA, PB/Mins/10, p. 233).
- ³³ 18 Apr. 1783 (DCA, PB/Mins/10, p. 256).
- ³⁴ 2 May 1783 (DCA, PB/Mins/10, p. 271).
- ³⁵ 19 Sept. 1783 (DCA, PB/Mins/11, p. 55).
- ³⁶ *Leinster Journal*. 1798. 22 Sept.
- ³⁷ Pool, R. and Cash, J. 1780, *Views of the most remarkable buildings*, p 16.
- ³⁸ 26 July 1774 (DCA, PB/Mins/1, p. 39).
- ³⁹ 19 Sept. 1783 (DCA, PB/Mins/11, p. 55).
- ⁴⁰ 4 June 1796 (DCA, PB/Mins/32, p. 93).
- ⁴¹ '[Private yards] not being in the public streets or passages'. 15 May 1793 (DCA, PB/Mins/28, p. 37).
- ⁴² 11 & 12 Geo. III, c. 13 [Ireland] (1772).

- ⁴³ O'Cionnaith, F., 2015, *Exercise of authority*, p. 35.
- ⁴⁴ 28 Oct. 1782 (DCA, 1782, PB/Min/10, p. 97).
- ⁴⁵ *Ibid.*
- ⁴⁶ Law, H., 1885, *Rudiments of the art of construction*, p. 90.
- ⁴⁷ Evans, W., 1855, *A treatise*, p. 131, p. 200; Law, *Rudiments of the art of construction*, p. 120. Each maul weighed around fourteen pounds and was made of beech or elm.
- ⁴⁸ Located in Ballinacarrick and Ballinaclay, near Arklow Co. Wicklow, 6 Dec. 1784 (DCA, PB/Mins/13, p. 176); Guernsey and Aberdeen were also recommended sources, Law, H., 1855, *Rudiments of the art of construction*, p. 120.
- ⁴⁹ Evans, W., 1836, *A treatise*, p. 200.
- ⁵⁰ Law, H., 1855, *Rudiments of the art of construction*, p. 121.
- ⁵¹ Edgeworth, R.L., 1817, *An essay*, p. 25.
- ⁵² Parnell, H.B., 1833, *A treatise on roads*, p. 133; Law, H., 1855, *Rudiments of the art of construction*, p.120.
- ⁵³ McAdam, J., 1816, *Remarks*, p. 8.
- ⁵⁴ *Ibid*, p. 9.
- ⁵⁵ *Ibid*, p. 32.
- ⁵⁶ Edgeworth, R.L., 1817 *An essay*, p. 24; Evans, W., 1836, *A treatise*, p. 200; Parnell, H.B., *A treatise on roads*, p. 133.
- ⁵⁷ Examples included Great Britain Street, Loftus Lane and Cavendish Row.
- ⁵⁸ Examples included Leinster Street, Nassau Street and Aston Quay that had Strand Paving and Essex Bridge that were identified as being paved in 'Arklow Stone'.
- ⁵⁹ Examples included Ely Place, Exchange Street, Smock Alley, Bishop Street.
- ⁶⁰ Examples included Cook Street, Blind Quay, Sackville Lane and Liffey Street.
- ⁶¹ *Dublin Literary Journal*, 1843. 1 Oct.
- ⁶² Law, H., 1855, *Rudiments of the art of constructing*, p. 123.
- ⁶³ 12 Dec. 1783 (DCA, PB/Mins/11, p. 149).
- ⁶⁴ *Ibid.*
- ⁶⁵ *Dublin Evening Post*, 1784. 8 Apr.
- ⁶⁶ *Ibid.*
- ⁶⁷ Postscript (DCA, PB/Mins/11, p. 237).
- ⁶⁸ O'Cionnaith, F., 2015, *Exercise of authority*, p. 86.
- ⁶⁹ 12 & 13 Vic, c. 97 (1849).