1.0 Introduction

Auditing provides a system of design checks that can be carried out to promote 'best practice' design solutions. They can demonstrate that the appropriate consideration has been given to the relevant aspects of the design. Auditing processes in Ireland generally focus on particular aspects of a design, such as safety[1] or a particular user experience, such as mobility impaired users.[2] For large scale/complex projects several audits may be undertaken. However as these audits primarily focus on a particular issue they may not fully engage with the complexity of issues that need to be considered when designing streets and street networks. The *Quality Audit* process seeks to integrate existing auditing processes and expand their scope to fully embrace a multi-disciplinary approach to street design *(See Figure 1)*.

As noted in Section 5.4.2 of the *Design Manual for Urban Roads and Streets (2013)*, *Quality Audits* have not been widely prepared in Ireland, however they are more commonly sought/provided in the United Kingdom. An Advisory Leaflet issued by the UK Department for Transport in 2011[3] notes the benefits of a *Quality Audits* as:

- A transparent process that demonstrates that the needs of all user groups have been considered alongside the design objectives.
- A checking procedure that facilitates the projects objectives to be delivered.
- A documentation process that clearly demonstrates the breadth of issues that have been considered and how decisions were arrived at.
- A cost saving exercise that reduces the likelihood of problems at completion.
- A process that encourages greater engagement with stakeholders.

DMURS *Advice Note No. 4* provides designers with guidance in relation to the preparation and content of *Quality Audits* in Ireland. This includes guidance in relation to a *DMURS Street Design Audit,* that can be submitted as a component of a *Quality Audit* (for larger projects) or as a stand-alone audit process for smaller projects.

It should be noted that it is not the intension of these guidelines to create a further layer of documentation in relation to the development process. In this regard *Quality Audits/ DMURS Street Design Audit* may be used to complement or supplement the existing range of reports submitted in support of development.

1 *Auditing processes are familiar to the engineering profession, such as in the form of Road Safety Audits (RSA).*
2 *Guidelines for Access Auditing of the Built Environment have been issued by the National Disability Association.*
3 *Refer to UK Department for Transport Traffic Advisory Leaflet 5/11- Quality Audits (2011).*

Figure 1: Street design is a complex process that must consider the many issues related to movement (users) and place (experience).

2.0 Contents of a Quality Audit.

Quality Audits should consist of two major parts (see also Figure 2) .

- *Individual Design Audits.*

  These will consist of a *DMURS Street Design Audit* (See Section 4.1) and other individual *Design Audits (See Section 4.2)* that assess different aspects of street design, as required.

- *Quality Audit Report.*

  The *Quality Audit Report* will summarise the issues raised within each individual *Design Audit*, identify any potential conflicts between audits and propose solutions. All solutions should be measured against the main objectives of the project and presented as a series of recommendations (See Section 5.0).

3.0 Individual Design Audits

3.1 DMURS Street Design Audit

The use of DMURS in urban areas is mandatory[4] and the *DMURS Street Design Audit* is an auditing tool that can be used to ensure that the relevant issues contained within DMURS have been duly considered. The *DMURS Street Design Audit* is primarily concerned with four major aspects of street design:

- Connectivity
- Self-Regulating Street Environment
- Pedestrian and Cycling Environment
- Visual Quality

The DMURS Street Design Audits consists of a series of short tables that can be used to cross check a design against the principles, approaches and standards contained within DMURS. In doing so, it should be clear that:

- The issue is relevant or not relevant.
- The issue has been considered in accordance with the principles of DMURS.
- The issue is addressed in a more detailed design audit (see Section 3.2)

4 *Refer to DTTAS Circular RW 6/2013*

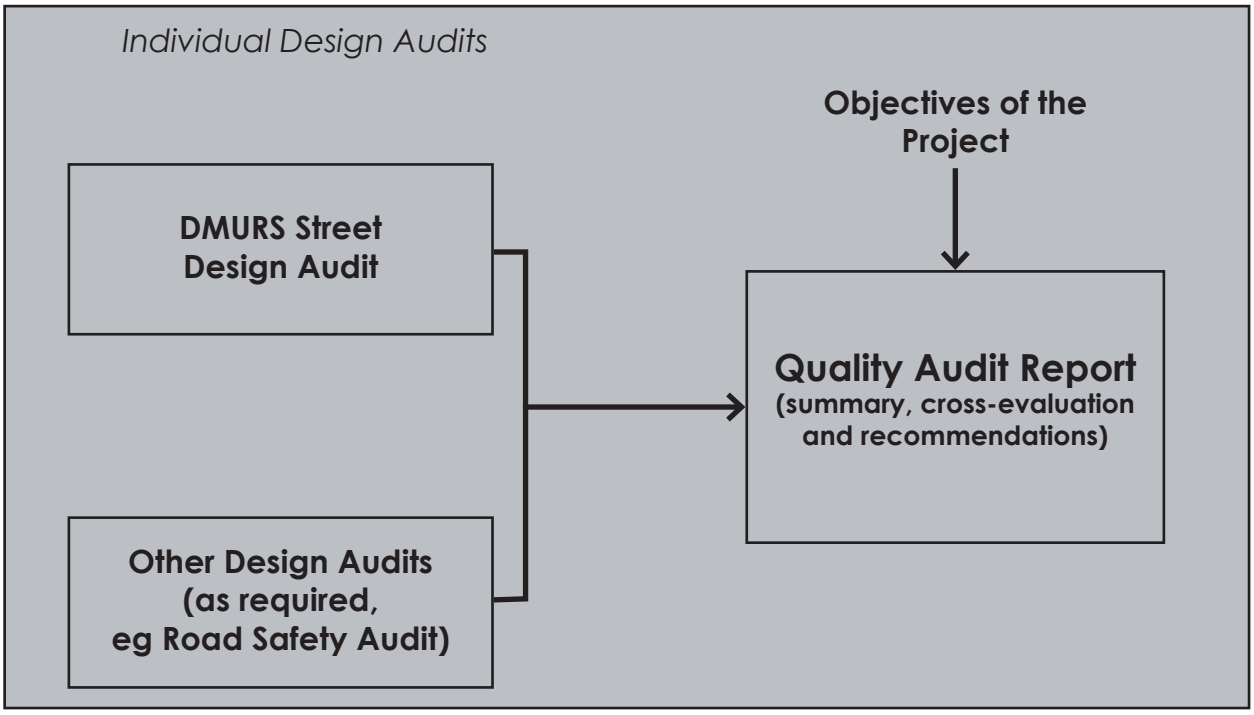


Figure 2: Quality Audits consist of two major parts that examine and cross evaluate a broad range of issues related to street design.

- The relevant approach or standard has been applied.
- Or if not, why not, and what mitigation measures have been applied (i.e. what is the alternative solution).

A template for the DMURS Street Design Audit is available from www.dmurs.ie

3.2 Other Design Audits

Other *Individual Audits* will generally focus on particular aspect of the design or the likely experience of a particular user group. These include:

- Road Safety Audits (including Risk Assessment).
- Pedestrian and cycling audits (e.g. Non-Motorised User Audit, Walkability Audit, Cycle Audit).
- Mobility and visually impaired users audits (e.g. Access Audit, Universal Design Audit, Wheelchair Audit).
- Visual quality audits (e.g. Placecheck, Materials Audit)
- Community audits (e.g. Community Street Audit).

Auditing requirements will vary greatly according to the urban context and the function of a street. In general designers should be guided by:

- Guidelines that specify under what circumstances the audit should be carried out.
- The nature of the project requires greater focus on a particular user experience.
- The complexity of issues cannot be adequately addressed within the tables contained within the *DMURS Street Design Audit* and need to be expanded upon.

For example:

- There are clear guidelines relating to when a Road Safety Audit should be carried out[5].
- Audits focusing on pedestrian movement should be considered in areas where such activity is likely to be high (such a city, town and village centres - See Figure 3) and may be completed using particular tools such as the Pedestrian Environment Review System (PERS), or Pedestrian Spatial Calculator developed by Dublin City Council.[6]

5 *Refer to TII GE-STY-01024 - Road Safety Audit*
6 *Refer to Appendix 1 The Heart of Dublin City Centre Public Realm Masterplan*

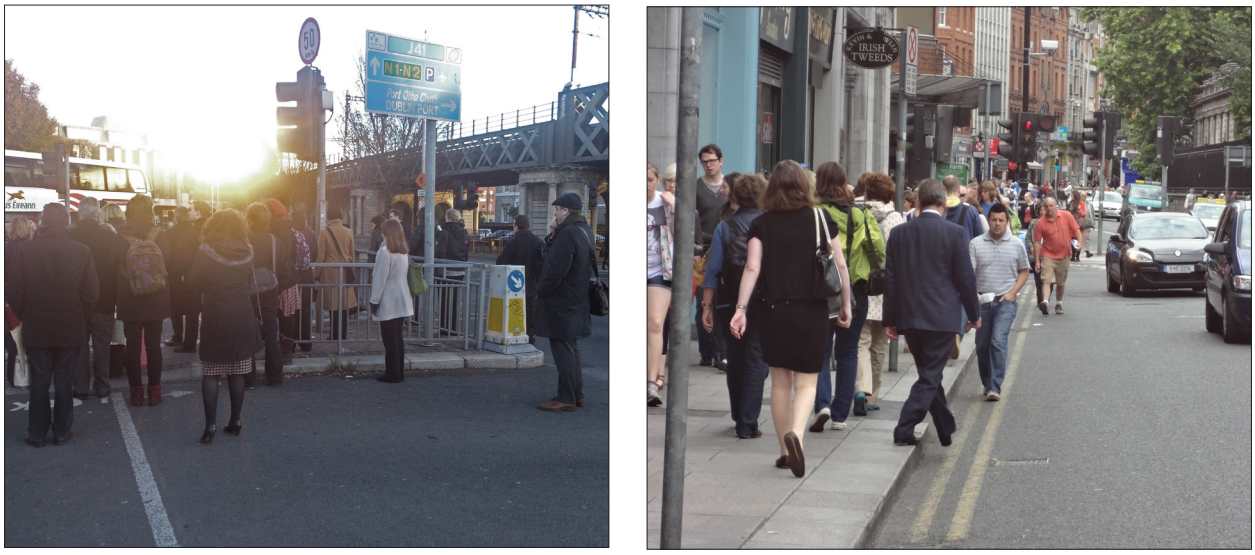


Figure 3: Pedestrian focused audits will highlight issues related to adequacy of pedestrian facilities and identify barriers.

- Audits focusing and bicycle users should be considered for projects where strategic cycling infrastructure is being implemented (in particular on Primary, Secondary or Greenway Routes as defined within the National Transport Authorities Cycle Network Plan for the Greater Dublin Area or on school routes).
- Mobility and visual impaired users have particular needs that may not be picked up in more general pedestrian audits. Audits which check against the principles of Universal Design are highly recommended for all major projects, in particular where shared spaces (i.e. shared carriageways) are proposed to ensure the needs of visually impaired users are catered for (see Figure 4).
- Visual Quality Audits should be considered where place values are high (i.e. city, town and village centres), in areas of civic or cultural importance (i.e. around protected structures, within Architectural Conservation Areas and tourist precincts - see also figure 5).

4.0 Quality Audit Report

The Quality Audits Report should first and foremost be informed by the objectives of the project. These should be agreed and prepared by the Design Team at the initial stage of the project. As noted in the UK Manual for Streets[7], when setting objectives they should be:

- Reviewed and revised as the projects evolves (particularity for lengthy or complex projects).
- Should be expressed as outcomes that are clearly measurable
- Relate to the various activities that will take place in the street (or street network)

The objectives of the project should also have regard to the four main principles of DMURS:

- The creation and management of permeable and legible street networks
- The creation of self-regulating streets that cater for a range of activities
- A clear focus on the pedestrian environment
- Outcomes that are a result of a multi-disciplinary process.

7 *Refer to Section 3.7 - Stage 2: Objective Setting of the Manual for Streets, 2007.*

Figure 4: Cycling Audits will highlight the challenges faced by cyclists.

Figure 5: Visual Quality Audits will highlight issues relating to clutter and/or poor use of materials.

The report should contain an summary of review of all Individual Audits, highlighting:

- The major findings of the individual audits.
- Any conflicts between (or within) individual audit or with the objectives of the project.
- Provides clear recommendations on how any conflicts should be (or have been resolved), with regard to the project objectives.

Where conflicts occur the report should clearly outline how priorities where balanced, what alternatives options where explored, and what mitigation measures, if any, are required or have been proposed to resolve the issue (see also - Adamstown Case Study).

There is no set format for Quality Audits, however regard should be had to the above when setting out the main report.

5.0 When should a Quality Audit be undertaken?

Quality Audits should be submitted for major projects and in support of:

- Applications for planning permission and development consents to planning authorities and An Bord Pleanála,

or

- Development proposals prepared under Part 8 of the Planning and Development Regulations 2001, as amended.

Strictly defining what entails a 'major project' is problematic, as this will differ according to the location, scale and complexity of the project. In general, major projects will involve

- the creation of new streets/street networks

  or

- significant changes to existing streets

  or

- be of a complexity that the need for multiple audits arises, thus requiring cross evaluation via a *Quality Audit Report*.

As detailed below the *DMURS Street Design Audit* will address a number of issues regarding safety, movement and quality. As such for smaller/less complex projects (e.g. where a Road Safety Audit is not required) the completion of *DMURS Street Design Audit* should suffice.

Quality Audit – Sample Case Study
Adamstown Homezones

Several homezones have been constructed as part of the Adamstown Strategic Development Zone (SDZ). The example below was constructed in 2007. The carriageway consists of a shared surface (shared by vehicles, cyclists and pedestrians). The homezone provides access to some 90 dwellings, two primary schools and a secondary school. It will also form part of a strategic pedestrian link between adjacent residential neighbourhoods, Adamstown train station and the future district centre.

The objective of the Homezone is the creation of a highly amenable urban environment that:

- Passively calms traffic to create a low speed environment.
- Maximises mobility for pedestrians by enabling them to walk safely and freely on any section of the street.
- Creates a strong sense of place, providing an attractive environment and pleasant experience for pedestrian/cyclists, so as to encourage journeys by sustainable modes.

The following exercise demonstrates the general form a *Quality Audit* report may take. This is not a comprehensive example, rather a snapshot of how particular issues may be documented and addressed in this context.

Road Safety Audit

Summary of Issues

- A potential hazard is created where pedestrians, cyclists and motor vehicles share the carriageway.
- It is recommended that separate footpaths be provided.

Possible Conflicts with Other Audits/Project Objectives

- Segregation of pedestrians and motorists may serve to increase vehicle speeds and reduce pedestrian mobility, conflicting with the objectives of the project.

Conclusions/Recommendations

- The characteristics of the street (close building lines, use of paved surfaces, narrow carriageway, landscaping/ planting) send a clear message to drivers that the street is to be shared and will ensure a low speed environment is created.

Adamstown Homezone

- Segregation measures which increase vehicle speeds would conflict with the objectives of the project (thus increasing the potential severity of any accident[1]).
- Segregation measures may not be effective taking into account the narrowness of the street and the large numbers of pedestrians present during school drop off/pick up times.
- Verges adjacent to the carriageway will enable pedestrians to step aside and allow multiple vehicles to pass.
- Although the street is self-regulating by design, this could be supplemented via the use of information signage with advisory speeds[2] at key access points.

Accessibility Audit

Summary of Issues

- Shared spaces can lead to difficulties for visually impaired users who may rely on kerb lines to navigate streets.
- Shared spaces may be intimidating for visually impaired users whom cannot rely on eye contact with drivers to communicate.
- It is recommended that footpaths and kerbs be provided.

Possible Conflicts with Other Audits/Project Objectives

- Segregation of pedestrians and motorists may serve to increase vehicle speeds and reduce pedestrian mobility, conflicting with the objectives of the project.
- Any increase in design speeds would conflict with the *DMURS Street Design Audit* which states a design speed of 10 km/h has been applied.

Conclusions/Recommendations.

- The characteristics of the street will create a low speed environment that, on balance, is safer for all users.
- As drivers travel at lower speeds pedestrians with mobility impairments will be more readily identified.
- The street/carriageway edge is defined by building lines, planted areas and drainage channels that will aide navigation.
- Navigation measures could be supplemented via the use of tactile paving at junctions and key crossing points.

1 *A Risk Assessment should address this issue.*
2 *Refer to Section 4.1.1 of DMURS.*

A combination of the narrow carriageway, close building lines, landscaping and materials send a clear message to drivers that they are entering a shared/low speed environment.

Further information signs and advisory speed limits ensure users are aware of the carriageway conditions.

Materials Audit

Summary of Likely Issues

- Extensive areas of paving are prone to failure where they are continuously crossed by vehicles (in particular bin lorries and HGVs).
- Areas of broken paving can be a maintenance liability and potential trip hazard.

Possible Conflicts with Other Audits/Project Objectives

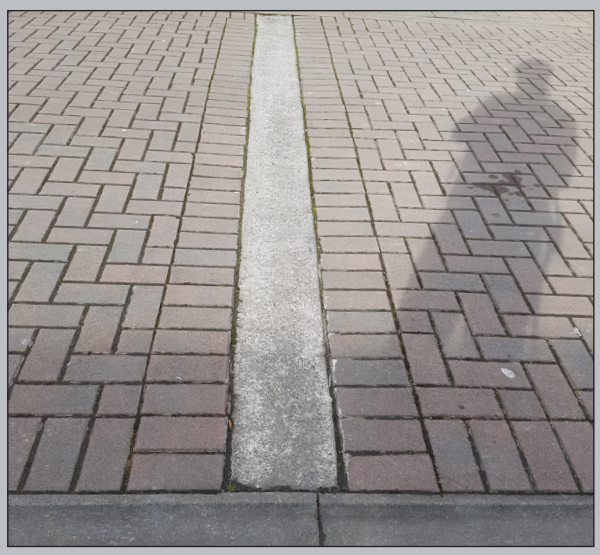
- Removal of paved areas may create ambiguity in regard to the shared nature of the space, conflicting with the project objectives.
- Removal of paved areas may serve to increase vehicle speeds, conflicting with the objectives of the project.
- Removal of paving and replacement with lesser material will conflict with a *Place Audit* which seeks to maximise visual amenities.

Conclusion/Recommendations

- Use of paving is essential to the creation of a shared space and very low speed environment.
- Use by larger vehicles is infrequent.
- All paving should be built to a high standard (see also DMURS Advice Note 2 - Material and Specifications) to ensure durability and minimise maintenance.
- Banding could be used to separate sections of paving and limit the spread of any failures.

Note: Homezones within Adamstown have been in operation for over a decade. During this time there have been no known incidents or accidents between pedestrians and motor vehicles, or complaints with regard to driver behaviour. This is despite heavy use in some areas during school pick ups/drop off with permeability restrictions being only recently implemented. The paved areas have also held up well, requiring little or no maintenance. It should also be noted that those areas where asphalt was used (at junctions) have performed poorly and had to be replaced in 2010 after severe winter weather.

Drainage channels and planted areas define the edge of the carriageway to assist in guiding the visually impaired.



Sections of paving are separated by concrete bands, limiting the extent of any possible failures.

6.0 Who should carry out a Quality Audit?

The *Quality Audit Report* should be carried out by the Design Team. The Design Team may however feel as though the process may benefit from having an independent appraisal or be carried out by person(s) with a broad skill set. The final *Quality Audit* should be signed off by the Project Manager.

The personal required to carry out individual audits will vary. The *DMURS Street Design Audit*, or other Specialty Audits may be a carried out by the Design Team or persons(s) acting on their behalf. Some audits may require input from outside of the Design Team, such as the Road Safety Audits which is required to be completed by a certified auditor[8]. Further personal may also be needed where a particular expertise is not within the resource base of the Design Team.

7.0 At what stage should a Quality Audit be carried out?

There are two key stages where a Quality Audit should be carried out.

- Initial design stage
- Detailed design stage

Design Audits should also be considered at the Analysis Stage when retrofitting. This will be of particular benefit to identify the major issues that need to be addressed via the design process.

8 *It is also essential that in urban areas, Road Safety Auditors have an understanding of DMURS.*