

Safety Review

of

Proposed Revised Loading Arrangements at St. Michan's Street, Dublin 1



On Behalf of:

**Dublin
City Council**

**September
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1 Introduction

1.1 Background and Purpose

This report results from a safety review carried out on proposed revised loading arrangements for the Fruit & Vegetable Markets at St. Michan's Street, Dublin 1. The safety review has been carried out at the request of Ms. Patricia Reidy of Dublin City Council Traffic Department.

A site visit was conducted on the 3rd October 2013, during which the weather was dry and the road surface was wet. The purpose of this safety review is to review the scheme proposals and to identify any road safety/potential collision problems and to suggest possible measures that would contribute to collision reduction.

2 Scheme Details

2.1 Current Situation

St. Michan's Street runs along the eastern side of the Fruit & Vegetable Market building located between Mary's Lane and Chancery Street, to the west of Capel Street, in Dublin City. St. Michan's Street currently operates as a one-way street, with vehicles entering from the north, at its junction with Mary's Lane, and exiting at the south onto Chancery Street where vehicles must turn left and travel eastbound in the traffic lane adjacent to the Luas line.

Currently loading/unloading of vehicles associated with the markets occurs along St. Michan's Street. This primarily takes the form of echelon parking along the western side of the street by goods vehicles, with goods conveyed by manual or powered forklifts to/from the market traders premises.

The parking arrangements along the western side of the street are facilitated by build-outs at the entrance & exit from St. Michan's Street which encourage through traffic onto the eastern side of the street, leaving the western side available for parking.

Loading/unloading operations also occur from vehicles parked on the adjacent Mary's Lane, which also serves other (similar) businesses in the vicinity of the markets. There is a considerably greater volume of through traffic on Mary's Lane, both vehicular and pedestrian, compared with St. Michan's Street. Similar to St. Michan's Street the loading/unloading operations are facilitated by manual and powered forklifts.

2.2 Current Traffic Conditions

2.2.1 Accidents

The National Accident Database, maintained by the Road Safety Authority, contains details of three personal injury accidents at St. Michan's Street for the period 2005 to 2011. All of the collisions resulted in minor injuries, and all involved conflicts between vulnerable road users and vehicles/goods vehicles. Two involved pedestrians and one a cyclist.

During the site visit traffic speeds were observed to be low, which would lead to an expectation of low speed/energy collisions resulting in predominantly material-damage only collision type.

The number, and pattern, of collisions recorded gives rise to a certain amount of concern in relation to the interaction between vulnerable road users and vehicles in the general vicinity of the markets.

2.2.2 Traffic Flows

During the site visit traffic speeds in the area were generally noted as being low. Details of 24-hour traffic counts undertaken in the vicinity of the proposed improvements/development were provided. The traffic counts took place on the 31st of May 2013, and included classified counts of all vehicles and their turning movements.

A review of the survey information indicates that 509 vehicles entered St. Michan's Street at its northern extent, of which 215 were goods vehicles and 110 were forklifts. This means that of vehicles accessing St. Michan's Street approximately two-thirds were goods vehicles or forklifts. 91 vehicles exited St. Michan's Street at its junction with Mary's Lane, in contravention of the one-way system in place. Of these 74 were forklifts and 5 were goods vehicles.

Also noteworthy was the total volume of forklifts on Mary's Lane, George's Hill and St. Michan's Street which over the course of the 24-hour period equated to 18% of the total traffic volumes at this junction. Most of the forklift traffic was concentrated during the morning time, with the period between midnight and noon experiencing 32% of all vehicular traffic as forklifts.

2.3 Scheme Description

It is proposed to carry out improvements to the existing Fruit & Vegetable Markets. As part of the improvements it is proposed to alter the layout of the carpark on the opposite side of St. Michan's Street from the market buildings.

It is also proposed to incorporate a contraflow lane on the western side of St. Michan's Street for forklifts to travel from the car park to the market building.

The proposed alterations to the car park include alterations to the internal layout, the provision of new vehicular entrances from St Michan's Place at the southern extent of the car park area, the removal/replacement of the existing boundary between the car park and St. Michan's Street to make it more permeable to pedestrian traffic, and the provision of a dedicated loading area for the market traders which will also include recycling/waste disposal facilities.

Vehicles wishing to access the loading area can do so from St Michan's Place or from St. Michan's Street, while egress would be via St. Michan's Street only. Similarly access to the car park would also be facilitated via St Michan's Place, and also via the existing access/egress location on Mary's Lane.

Vehicle parking on St. Michan's Street would cease, and the associated loading operations would move to the new loading area. As a consequence forklifts would be required to travel to/from the new loading area and the market building. Forklift movements from the market building to the loading area would occur with the direction of existing one-way traffic flow on St. Michan's Street. Forklift movements from the loading area towards the markets would be catered for by the provision of the contraflow lane along the western side of St. Michan's Street (where vehicles currently park).

3 Issues Identified

3.1 Issues Identified during Site Visit

3.1.1 Problem

Loading/Unloading Operations within Street Area

During the site visit it was noted that most/all loading/unloading operations in the vicinity of the markets occurs on-road. The mix of different activities including through-traffic (vehicular, pedestrian & cyclist), parked vehicles, goods storage at the roadside and the loading operations leads to a complex environment with many opportunities for conflicts between the various users.

3.1.2 Problem

Temporary On-street Storage of Cargo & Palettes

During the site visit it was noted that pallets/cages (empty and full) are being stored along the edge of the carriageway on both St. Michan's Street and Mary's Lane. The storage of empty pallets & goods leads to a number of potential hazards: -

- potential for vulnerable road users to come into conflict with the pallets/cages;
- pallets/goods could obscure a crossing pedestrian from an approaching driver's view leading to potential vehicular/pedestrian conflicts; and
- storage of materials at the road edge reduces the available parking spaces, resulting in inappropriate parking, including parking within the footways.

3.1.3 Problem

Destinations/Routes for Forklifts

The traffic survey data, and observations during the site visit, indicate that deliveries relating to the market traders on St. Michan's Street also originate from goods vehicles parked on Mary's Lane, leading to forklift manoeuvres between St. Michan's Street and Mary's Lane. This leads to forklift manoeuvres exiting St. Michan's Street at its northern extent, in contravention of the one-way system in place.

There is a danger that other road users may not be prepared for vehicles, or forklifts, exiting St. Michan's Street at this location giving rise to potential conflicts.

3.1.4 Problem

Measures for Visually Impaired Pedestrians

During the site visit it was noted that no tactile paving has been provided at the existing dropped kerb provisions at the northern end of St. Michan's Street.

This could result in visually impaired pedestrians inadvertently entering the carriageway area, leading to potential conflicts with vehicular traffic.

3.2 Possible Issues arising from Proposals

3.2.1 Problem

Contraflow Forklift Lane

The proposed contraflow forklift lane will be a unique/unusual feature in the context of the local (and national) road network. It is unclear how the travelling public will adapt to the proposal.

In principle there would not appear to be any particular difficulty with the proposal, that could not be addressed during the design development. Care would be required in the design in order to minimise the potential for conflicts to arise. Conflicts that could arise include:-

- Uncontrolled forklift turning manoeuvres from the contraflow forklift lane across the opposing traffic lane;
- Vehicle encroachment into the contraflow lane requiring forklift operators to manoeuvre into the opposing traffic lane in order to continue their journey;
- Potential trip hazards created by any physical delineation between the contraflow lane and adjacent traffic lane; and
- The possibility that the contraflow lane may become a temporary on-street storage area, requiring forklift operators to remain within the traffic lane regardless of their direction of travel.

3.2.2 Problem

Limited Forward Visibility for Forklift Operators

During the site visit the loading/unloading operations being carried out by the forklifts generally consisted of small loads on pallets. However there is a reasonable likelihood that larger loads could be involved. The height of these larger loads on pallets could be such that forklift drivers' forward visibility would be limited/restricted. This limited forward visibility could result in potential conflicts with other road users, in particular pedestrians/vulnerable road users.

3.2.3 Problem

Interaction between Vulnerable Road Users and Loading/Unloading Operations

As part of the proposed improvements it is intended to alter the eastern boundary of the car park, adjacent to St. Michan's Street, to permit patrons from the car park easier access to the market buildings.

A concern arises in relation to vulnerable road users crossing the contraflow forklift provision. This layout/arrangement would not be common and could result in pedestrians coming into conflict with forklifts or their loads.

The available collision data indicates a pre-existing issue relating to conflicts between vulnerable road users and goods vehicles at this location.

3.2.4 Problem

Shed Loads

Given the nature of the loading/unloading operations, and the nature of the cargo being handled, there is a high risk of load shedding on the route to/from the new loading/unloading area. Load shedding by a forklift travelling in either direction on St. Michan's Street could present a hazard to other road users.

4 Possible Remedial Measures

4.1 Existing Issues

4.1.1 Loading Operations

Potential conflicts will continue to exist where loading/unloading operations occur within areas accessible to the general public. The provision of the new loading area on St Michan's Street will minimise the current potential for conflicts on St Michan's Street, however potential conflicts will continue on Mary's Lane.

The removal of the existing boundary along the eastern side of the car park, to be replaced with a more permeable boundary arrangement, would permit pedestrians to directly enter the proposed contraflow forklift lane and also, by entering St Michan's Street, enter into an area where loading/unloading manoeuvres by forklifts will be continuing.

It is recommended that pedestrians wishing to access the markets from the car park be permitted to do so only at selected locations, and that measures be put in place to guide pedestrians to these crossings and that the crossings facilitate vulnerable road users (e.g. dropped kerbs to facilitate mobility impaired individuals, and associated tactile paving to warn visually impaired pedestrians of the carriageway hazard).

The provision of distinct crossing locations would increase forklift operators' awareness of the likelihood of pedestrian crossing manoeuvres, and increase their ability to act accordingly.

4.1.2 On-street Storage

The provision of the dedicated loading area on St Michan's Street will contribute to a reduction in the use of on-street/roadside storage of goods & palettes on St Michan's Street. However it is envisaged that the storage of goods/palettes on Mary's Lane is likely to continue.

Consideration should be given to the provision of a similar loading arrangement for businesses on Mary's Lane to that proposed for St Michan's Street. Alternatively businesses on Mary's Lane could be required to use the loading arrangements on St Michan's Street, however this would give rise to significantly more loading/unloading manoeuvres by forklifts serving these businesses which would need to be catered for in order to ensure a safe environment for all road users.

It is also recommended that liaison with an Garda Síochána be undertaken in order to discuss means of ensuring adherence to the revised loading arrangements and to minimise/remove the incidence of on-street storage of goods/palettes.

4.1.3 Inappropriate Manoeuvres

It is recommended that liaison with on Garda Síochána be undertaken in relation to enforcement measures to ensure compliance with restrictions on vehicle manoeuvres on the area, in the interests of the safety of all road users.

Alternatively a review should be undertaken of the primary desire lines/routes for the loading operations in the area and measures put in place to cater for these.

4.1.4 Visually Impaired Pedestrians

Crossing locations should include measures to facilitate mobility impaired individuals (for dropped kerbs or raised crossings) and associated tactile paving to warn visually impaired pedestrians of the carriageway hazard.

4.2 Proposals

4.2.1 Contraflow Forklift Lane and Interactions between Loading Operations & Pedestrians

Care should be taken in the design of the proposed contraflow forklift lane in order to minimise potential conflicts with other road users. Provide clear distinction of the contraflow lane by providing reboundable bollards, distinct surfacing or road markings. Unrestricted access for pedestrians from the adjacent car park should not be permitted, with pedestrian routes confined to the northern end of the car park, adjacent to Mary's Lane.

Locating the proposed contraflow lane along the eastern side of St. Michan's Street, as opposed to the western side, could minimise the interaction between forklifts and other traffic.

Enforcement measures will be required in order to ensure that inappropriate storage of goods/pallets does not take place (or continue) following the provision of the dedicated loading area on the opposite side of St

Michan's Street.

4.2.2 Forward Visibility & Shed Loads

Potential safety issues relating to forward visibility for forklift operators and load shedding are similar to potential hazards/concerns with the current arrangements.

It is difficult to see what measures could be incorporated to address these. It may be possible to provide a fence between the contraflow forklift lane and the adjacent traffic lane in order to minimise the effect of either of these potential safety concerns, however discussions with the traders and the implementation of agreed work practices are considered likely to be most effective, if adhered to.

5 Conclusion

No objections in principle to the proposed improvements, and the associated contraflow forklift lane, have been identified. However a number of recommendations are made in order to minimise potential for conflicts between road users, and in order to improve the safety of all road users. These are, in summary: -

1. Restricting pedestrian routes to/from the adjacent carpark to a point close to the St Michan's Street/Mary's Lane junction
2. The provision of well-defined pedestrian crossing locations, with associated measures for mobility & visually impaired road users
3. The consideration of a dedicated loading area for businesses on Mary's Lane
4. Increased enforcement of existing traffic restrictions & of inappropriate storage of goods within the road
5. Provide physical separation between the proposed contraflow forklift lane and the adjacent traffic lane, possibly with an associated railing
6. Discussion with businesses/traders on agreed work practices in relation to the use of forklifts and storage of goods, and ensuring implementation of these
7. Provide clear distinction of the contraflow lane by providing reboundable bollards within the median, distinct surfacing or road markings
8. Relocate the proposed contraflow forklift lane from the western side to the eastern side of St. Michan's Street to minimise interaction between forklifts and other traffic.