

The Union Street, Bedford, Turbo Project – View from the Saddle, albeit on foot!

The project and its implementation raises four basic questions:

a) **Concept Selection: Is the Turbo concept appropriate for this setting and does this junction merit a safety project at all?**

Elsewhere in the world, turbo roundabouts are rarely, if ever, installed in residential and town centre access roads. Furthermore an extensive literature search revealed there is no evidence, nor claims, that turbo style roundabouts improve safety for either cyclist or pedestrians. On the contrary, some countries specifically exclude cyclists and pedestrians from using this style of roundabout (notably Germany and the Netherlands), instead often providing them with grade separated facilities (bridges or underpasses) or nearby lights controlled crossings. (Note we have found one, controversial, turbo roundabout towards the edge of a residential area, at Floraplein, in Eindhoven in the Netherlands.)

Much play is made that this roundabout lies on a busy intersection, as A6 traffic negotiates a residential and town centre access road. However, through traffic, including a large proportion of the heavier element of traffic, will be removed when the Bedford Bypass is completed, in 2016.

The removal of through traffic, particularly the northbound through traffic manoeuvring through a right angle at this junction, will significantly change the pattern and volume of traffic movement in the area and on approach to the roundabout, calling into question the need for this solution.

b) **Design Process Management: Is the arrangement of pedestrian, cycle and vehicle paths sensible and logical and do they reduce conflict?**

From a cyclists point of view the biggest issue is the decision to place the cyclist crossing lane, alongside the zebra, on the side away from the roundabout. This is the opposite of the convention on European roundabouts and maximises the chances of cyclists conflicting with pedestrians.

A more sensible approach would be to place the cyclist crossing lane alongside the zebra on the side nearest to the roundabout, as per European practice. Short segregated paths, cutting the corners, combined with good quality entry and exit lanes, would then minimise conflicts with pedestrians and ensure cyclists leave and re-join the carriageway at a point where zebra crossing priorities are creating gaps or slowing traffic down.

There are also safety concerns regarding the decision to place island extensions in the path of motorists. Most turbo roundabouts use a radial style entry which, combined with raised lane dividers or very clear carriageway lane markings, serves to slow traffic on approach. Both provide road users with advanced indication of what is required in terms of lane use, encouraging them to use the correct lane and, once on the roundabout, continue in the direction of that lane.

As implemented there is little indication of the physical barrier, created by the island extension, when approaching and entering the roundabout. Out-of-lane drivers have little time to react on discovering they are in the wrong lane. The accident-waiting-to-happen is a motor vehicle wrongly positioned in the right hand lane closely following another vehicle. That vehicle restricts the forward line-of-sight of the following vehicle and, when the leading vehicle continues right, the following driver has only a few metres to react to avoid colliding with the extension.

Additionally entry and exit geometry on some arms retains the tangential approach of the original roundabout, doing little to slow speeds, particularly in the left hand (outer) lane...the lane most often used by cyclists.

c) Design Detail: What was the experience of those involved in the conceptual selection, detail design and execution?

There's little in the way of on-carriageway markings to identify entry points and exit lanes for cyclists. Cyclists wanting to use the off-carriageway facilities have to cycle whilst searching off-carriageway areas to spot where the facility starts. In one location the on-carriageway marking suggests a dropped kerb exit which isn't present....potentially leading cyclists to manoeuvre into dangerous situations.

Once off the carriageway cyclist must weave in and out of pedestrians, both walking along the (unsigned) "shared use" footpath and, most importantly, waiting to cross the carriageway. Furthermore boxes for services have been placed within the confines of the paved area and, additionally, a number of signposts remain in place, adding to the confusion and further complicating manoeuvring.

The poor quality of exits from the path onto the carriageway further undermines safety claims. In one place cyclists are directed to enter the carriageway in a space barely 40cm wide and over the edge of a dropped kerb. Notwithstanding that a forthcoming revision of TSRGD should enable dual-use of zebras, the current position is a trap for cyclists.

To emphasise safety issues arising from the basic configuration, road markings for motor vehicles are highly confusing, and we note instances where motor vehicles have come to a stop on the roundabout, drivers unable to discern what the markings mean.

d) And, finally...Is this even a turbo roundabout?

The basic turbo concept, as proposed by Fortuijn¹, features radial entries with raised on-carriageway lane dividers and clear marking to guide drivers through the roundabout, prevent lane changing and weaving, hence improving capacity and reducing the scope for side swipe accidents.

Unlike the Netherlands, German authorities, under pressure from motorcyclists, and to facilitate snow clearing, do not use the raised lane dividers that characterize Dutch turbo roundabouts and their approaches. That said, most feature radial approach and entries, with clear and continuous lane markings to guide drivers around the roundabout, helping to slow vehicles both on approach and traversing the roundabout, whilst still limiting scope for side swipe accidents.

These essential physical and design features, which contribute majorly to safety and capacity claims, are absent in Bedford's interpretation of the turbo roundabout concept.

1) Pedestrian and Bicycle-Friendly Roundabouts: Dilemma of Comfort and Safety - Fortuijn 2003

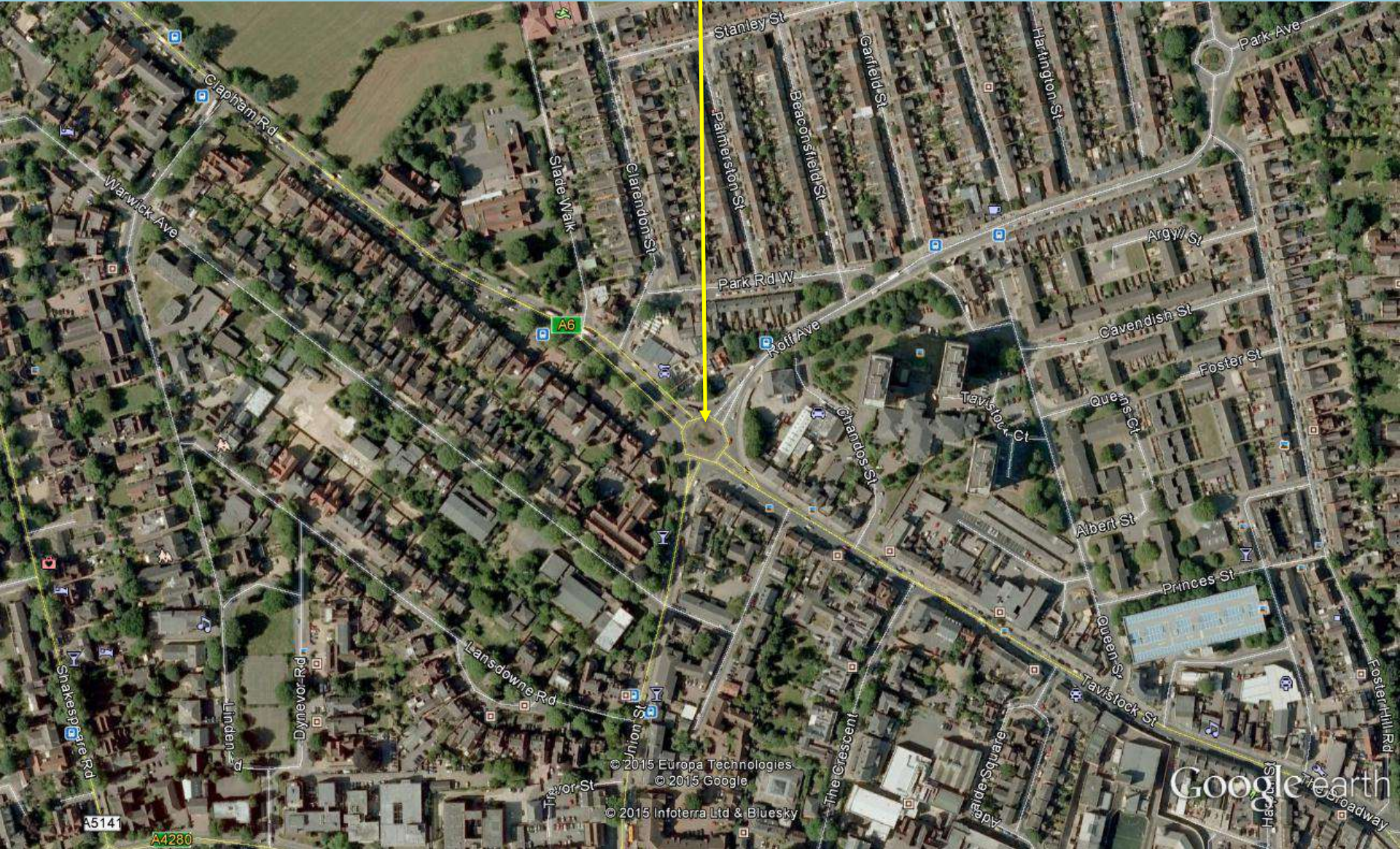
**DfT Cycle Safety Project
Union Street Roundabout, Bedford**

**A View from the Saddle,
- taken on Foot**

Graham Smith and John Meudell

Concept Selection

Union Street, Jct A6 - Bedford



Union Street, Jct A6 – Bedford

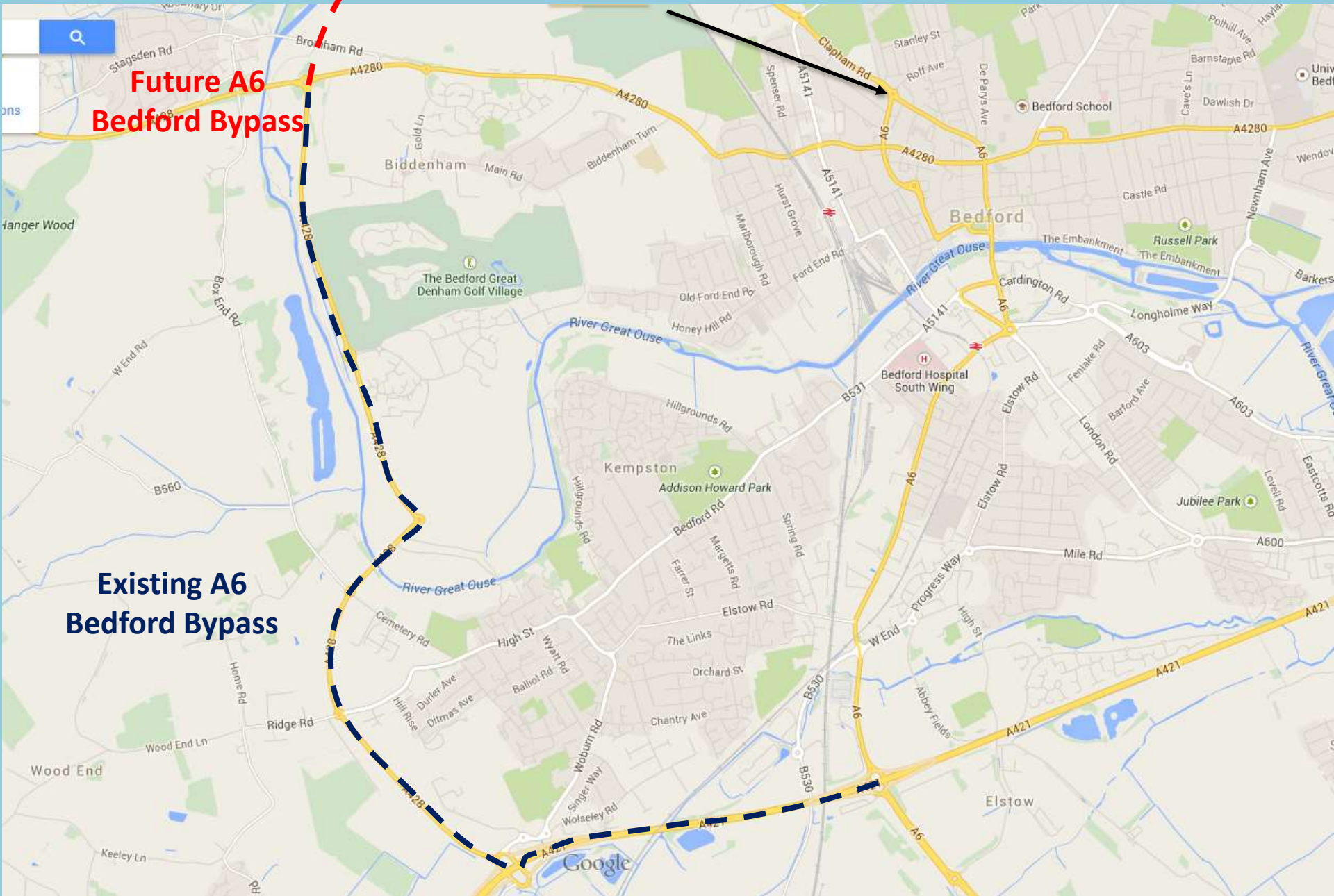
Approx 55m rectangular space



Union Street, Jct A6 - Bedford

**Future A6
Bedford Bypass**

**Existing A6
Bedford Bypass**



Design Process Management

Arrangement of cycle crossings maximises possibility of conflict between cyclist and pedestrian



Corner of Tavistock Street/Roff Avenue, looking west

Elimination of raised lane divider **does not deter** lane changing, undermining safety benefits



...vehicle positioning suggests inadequate advanced warning of roundabout configuration...

Extensions are invasive and increase likelihood of vehicle-to-vehicle or vehicle-to-island conflict



Corner Union Street/Tavistock Street, looking north

Turbo Road Markings?

...inadequate advanced lane separation approaching roundabout...



...conventional entry and exit radii undermines claims for speed reduction...

...unconventional carriageway markings confusing...



...conventional entry and exit radii undermines claims for speed reduction...

...unconventional carriageway markings confusing...



...is this physical intervention supposed to mean something...?



Cycle/Pedestrian Design Detail

Union Street, looking south west



- No on-carriageway markings
- Carriageway exit angle too sharp
- Double Yellow Lines over c/w exit

Union Street, looking north east



- No on-carriageway markings
- Carriageway exit angle too sharp
- Double Yellow Lines over c/w exit

Union Street, looking north east



- Control box impedes path at pedestrian/cyclist conflict point

Clapham Road, exiting northbound, looking south east



- Control box impedes path at:
- Pedestrian/cyclist conflict point
 - Cyclist manoeuvring point

Clapham Road, exiting northbound



- Inadequate lane width
- Entry/exit angle too sharp
- Cyclist have to cut corner

Clapham Road, exiting northbound



- Inadequate lane width
- Entry/exit angle too sharp
- Cyclist have to cut corner

Clapham Road, exiting northbound, looking south



- Transition cyclists to carriageway
- Either before crossing, or
 - At natural transition at this driveway



Carriageway
Resurfacing Works
Carried Out By
Bedford Borough
Council

NEW
ROAD
LAYOUT

- Cyclists transitioned at narrowest point in path
- Signs impede path
- No shared use signs
- No on-carriageway markings
- Path width much greater closer to roundabout.....

Roff Avenue, looking south west



-using an existing entrance
- No on-carriageway markings

Roff Avenue, looking north east



- Pedestrians obscure on-pavement markings
- No segregation

Tavistock Street, southbound to town centre



- Cyclists transition into an advisory lane with no priority markings
- Dangerous surface condition at transition
- Double Yellow Line marking illegal

Tavistock Street, northbound



- Where is carriageway exit for cyclists?!
- Vertical kerb prevents transition

Tavistock Street, northbound



- Where is carriageway exit for cyclists?!

Clapham Road, looking north west



- No on-carriageway markings
- Cyclists exit carriageway onto forecourt access, with no priority markings

Cyclists coming from Clapham Road into Roff Avenue



- Cyclists following the path behind the trees cut across a blind drive
- Cyclists following path around the carriageway edge come into conflict with pedestrians waiting to cross

Four basic questions:

a) **Concept Selection**

Is the Turbo concept appropriate for this setting? Does this junction merit a safety project at all?

b) **Design Process Management**

Is the arrangement of pedestrian, cycle and vehicle paths sensible and logical and do they reduce conflict?

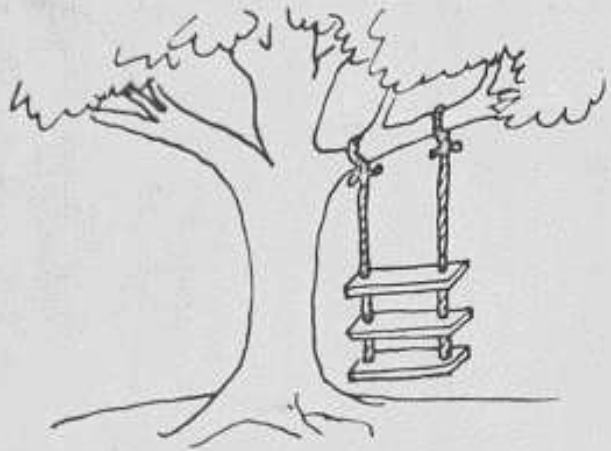
c) **Design Detail**

What was the experience of those involved in the conceptual selection, detail design and execution?

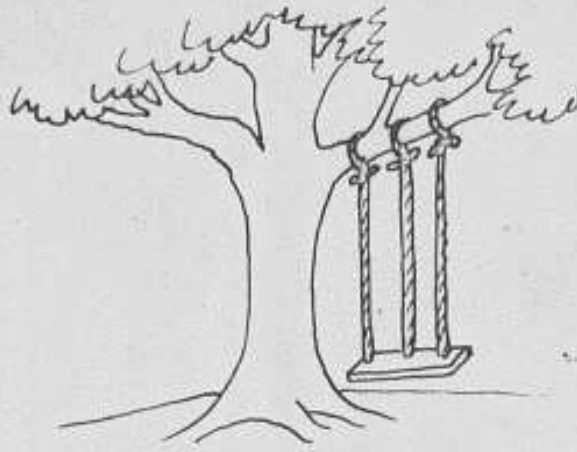
d) **And, finally...Is this even a turbo roundabout? Or even....**

a Cycle Safety Project?

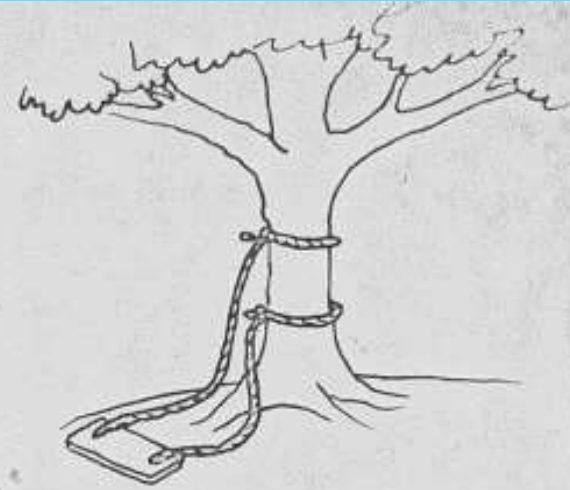
Or merely another “Lost in Translation” project.....?



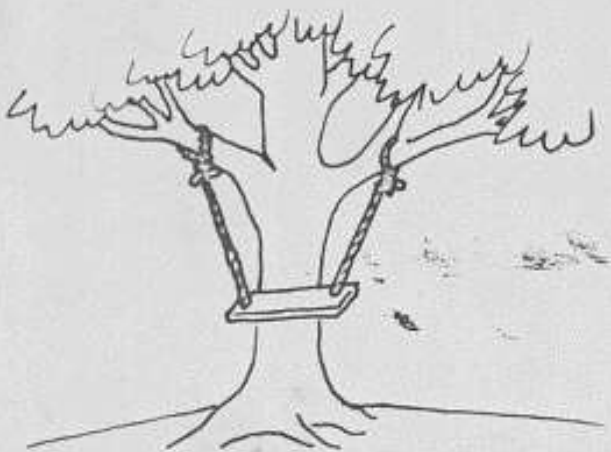
AS MARKETING REQUESTED IT



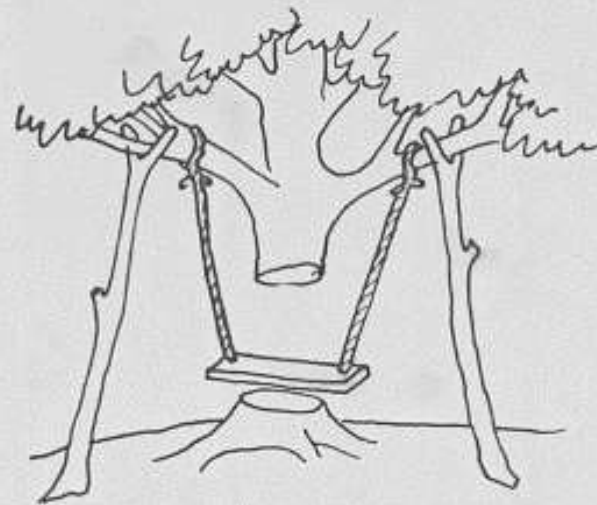
AS SALES ORDERED IT



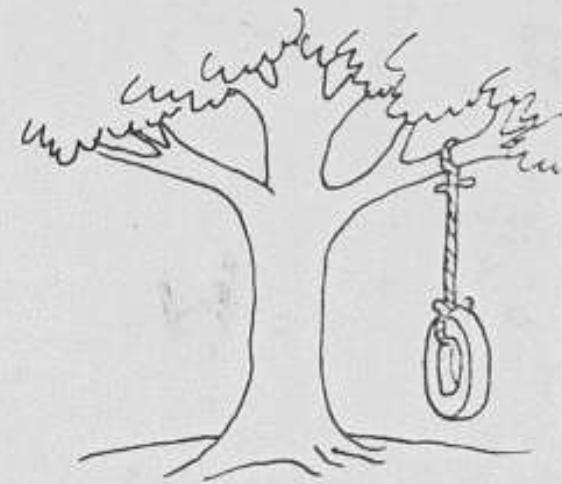
AS ENGINEERING DESIGNED IT



AS WE MANUFACTURED IT



AS FIELD SERVICE INSTALLED IT



WHAT THE CUSTOMER WANTED!!!

In which case.....Situation Normal!