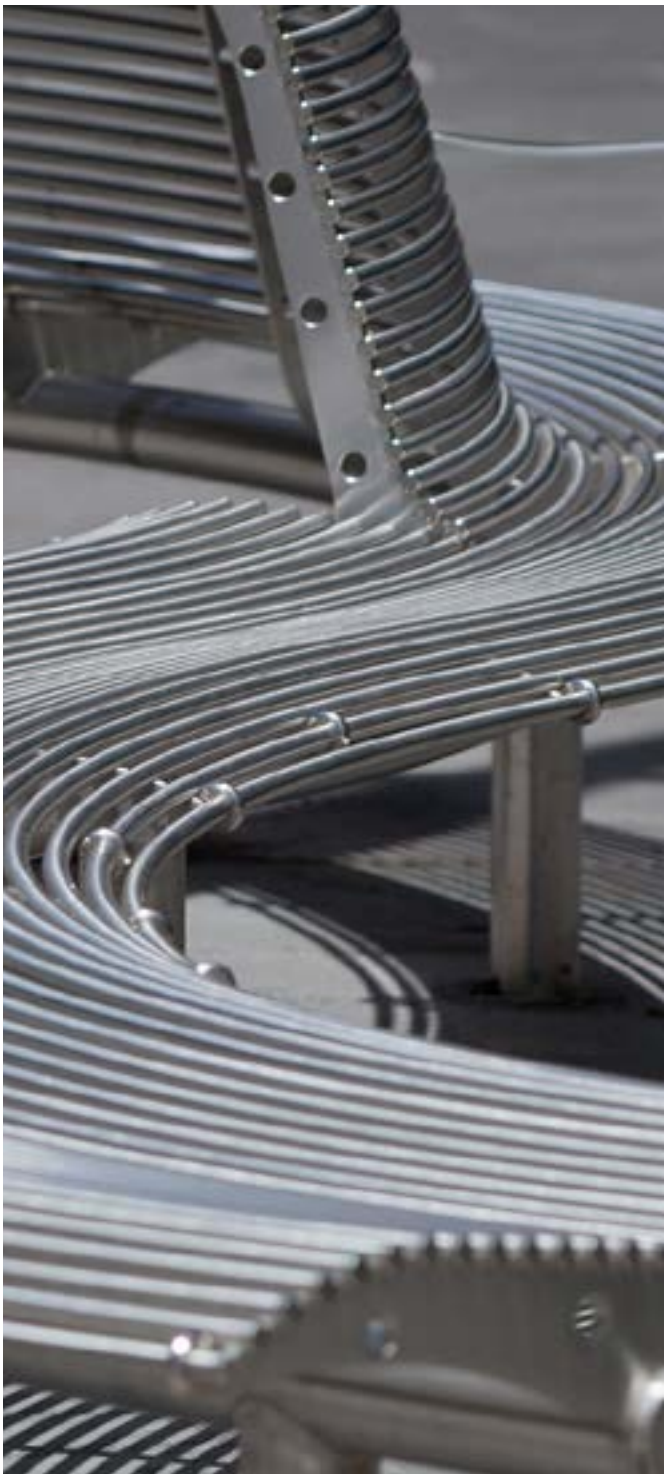
# Stainless Steel Street Furniture



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# Abstract

Street furniture has been a feature of urban settings for hundreds of years. Timber, wrought iron and coated steels, have commonly featured as material norms for street furniture despite these materials not offering long operational lives without regular maintenance interventions. It should also be noted that street furniture has a strong societal importance in our urban settings providing opportunities for people to relax and talk, to meet and even to enjoy lunch and drinks in an outdoor setting.

As our urban settings have grown larger the need for street furniture has increased and modern-day problems including graffiti and damage to items have started to blemish the appearance of street furniture which discourages people from visiting and enjoying urban settings to their full potential. These features have a negative impact on the ongoing success of economies in many of our urban centers.

It should also be recognized that as out-of-city retail outlets have become more commonplace there is a clear need to drive changes that will attract people back into urbans centers and support the regeneration and development of central urban economies.

In recent decades a common approach to urban regeneration, particularly when considering street furniture is to provide low cost solutions and replace those items on a frequent basis which is interestingly considered as urban modernization. By contrast some forward-thinking cities have undertaken cost studies on their use of non-resilient materials used for street furniture and compared those costs against the use of resilient materials like stainless steels for urban street furniture.

The results of changing to stainless steel street furniture have been staggering both from a financial perspective and a non-financial perspective. This case study identifies the benefits of selecting stainless steel as the primary materials choice for street furniture encompassing cost savings, operational longevity, a significant reduction in replacement and maintenance needs whilst making urban centers more appealing to the general public.

# Introduction

Street furniture in urban settings appears to be a divisive subject. There are many schools of thought associated street furniture products which include at their core seats, benches, recycling and waste bins, public transport shelters and water fountains.

For example, some local administrations believe that these products represent an opportunity to show off 'modern thinking' by regularly updating these items to project an image of regular renewal. Equally, some local administrations don't see the clear benefits urban street furniture bring and feel they do not have a significant impact on what makes urban centers attractive to people.

By contrast an increasing number of local administrations are now more wedded to the concept of creating timeless street furniture that offers long service lives and are designed with features that will attract increasing numbers of people into urban centers. Furthermore, aligned to these solid concepts of attractiveness and service longevity are the novel designs that make such products suitable and attractive for use in many weather conditions.

Many traditional items of street furniture are made from coated steel products which can include galvanized coatings, painted coatings and applied epoxy coatings. Whilst two of these coating options offer the opportunity to colour the street furniture, the clear downside of coatings it that they all fail over time. In many cases the failures of coatings are not uniform which results in visually unappealing street furniture products within urban settings.

In current times when many urban settings are now expanding and whilst not having excess cash to use it would appear sensible and logical that new approaches to materials selection for street furniture are seriously considered. The following section of this study looks at the transformation of one city from using Coated Carbon Steel for their street furniture to solely Stainless Steel.

# The History

Let us consider a real-world example based on an urban center which contains around 3kt of items street furniture, all made from Coated Carbon Steel. These items include waste and recycling bins, seats, benches and water fountains as the core pieces of street furniture.

They were designed to last for 15 years.

Using real data from a major city that has worked with both Coated Carbon Steel and Stainless Steel and the five specific street furniture products for many years we can supply the following actual in-service performance data in the table below.

***Table 1; Service Performance Data for Coated Carbon Steel Street Furniture***

| Item | Number in the city | Number destroyed | % Destroyed pa | Number repaired | % Repaired pa |
|---|---|---|---|---|---|
| **Waste bins** | 1200 | 260 pa | 22% | 200 pa | 17% |
| **Recycling bins** | 500 | none | 0% | none | 0% |
| **Seats** | 805 | 11 pa | 1% | 120 pa | 15% |
| **Benches** | 410 | none | 0% | 40 pa | 10% |
| **Water fountains** | 85 | 4 pa | 5% | none | 0% |
| **Total** | **3000** | **275 pa** | **9%** | **360 pa** | **12%** |
| **Initial Cost** | 2480k USD | | | | |
| **Over 15 Years** | | 4125 | | 5400 | |
| **Annual Cost Y2** | | 242k USD | | 120k USD | |
| **Annual Cost Y10** | | 295k USD | | 146k USD | |
| **15 Years Cost** | | 3982k USD | | 2000k USD | |

The above data shows that some items of street furniture are more at-risk to both destruction and damage. Furthermore, it can been seen that the proportions of destroyed street furniture items that are damaged and require repair is high.

Interestingly the total cost of the Coated Carbon Steel solution over 15 years was

2480k USD + 3982k USD + 2000k USD = 8462k USD

# The Alternative

As a result of the above findings and associated costs, the same city subsequently made the shift to all Stainless Steel street furniture which then provided the following results.

*Table 2; Service Performance Data for Stainless Steel Street Furniture*

| Item | Number in the city | Number destroyed | % Destroyed pa | Number repaired | % Repaired pa |
|---|---|---|---|---|---|
| Waste bins | 1200 | 156 pa | 13% | 40 pa | 3% |
| Recycling bins | 500 | none | 0% | none | 0% |
| Seats | 805 | 10 pa | 1% | none | 0% |
| Benches | 410 | none | 0% | none | 0% |
| Water fountains | 85 | 1 pa | 1% | none | 0% |
| **Total** | **3000** | **167 pa** | **6%** | **40 pa** | **1%** |
| Initial Cost | 3794 USD | | | | |
| Over 15 Years | | 2505 | | 600 | |
| Annual Cost Y2 | | 215k USD | | 12k USD | |
| Annual Cost Y10 | | 268k USD | | 14k USD | |
| 15 Years Cost | | 3217k USD | | 177k USD | |

An inflation rate of 2.50% has been applied for the increase in annual replacement and repair costs over the 15 years term noting that much of these costs are attributable to manpower.

By comparison the total cost of the stainless steel solution over 15 years was

3794k USD + 3217k USD + 177k USD = 7188k USD

Taking and comparing the two data sets it is possible to create the following summary table.

*Table 3; Material Performance & Cost Differences*

| Element | No. in city | Carbon steel costs | Stainless steel costs | Difference | Comments |
|---|---|---|---|---|---|
| **Initial costs** | 3000 | 2480k USD | 3794k USD | +1314k USD | in favour of CS |
| **Destroyed over 15Y** | 4124 in CS<br>2505 in SS | 3982k USD | 3217k USD | -765k USD | in favour of SS |
| **Repaired over 15Y** | 5400 in CS<br>600 in SS | 2000k USD | 177k USD | -1823k USD | in favour of SS |
| **Totals** | 9525 in CS<br>3105 in SS | 8462k USD | 7188k USD | -1274k USD | in favour of SS |

The negative values for the above differences represent the reduction in spending achieved by selecting Stainless Steel for street furniture.

Other interesting observations when considering the differences between Coated Carbon Steel and Stainless Steel street furniture items may be described as follows;

a. Stainless Steel street furniture performs better across the board notably;
    1. One third less of Stainless Steel street furniture items are destroyed annually.
        i. An interesting element in this case is that it is contractors working in the urban center that caused around 80% of the destruction.
        ii. The clear and impressive visibility of Stainless Steel street furniture items was significantly responsible for the reduction in the destruction numbers.
    2. The annual repair rate is only 1% for Stainless Steel items, compared to 12% for Coated Carbon Steel items
b. The spending reductions achieved are based over 15 years only and whilst the Stainless Steel street furniture items have now been in-situ for 25 years, the reduced maintenance spending levels continues to accumulate.

Items requiring repairs generally fell into the following two categories:

a. Routine maintenance including cleaning and graffiti removal
b. Repairs to corroded components (only applicable to Coated Carbon Steel items)

Graffiti removal costs were typically

a. 150 USD per 30m2 of surface area for Stainless Steel items
b. 310 USD per 30m2 of surface area for Coated Carbon Steel items

The cost of repairs to corroded components are generally large because they are manpower intensive often involving the removal of a corroded item for offsite repair. The cost difference figures between the two materials clearly back-up this assertion.

Of the 2000k USD spent over 15 years on repairs to Coated Carbon Steel items around 35% was spent on cleaning and general maintenance and 65% was spent on coating damage and subsequent corrosion-related issues.

Furthermore, the attractiveness of the stainless steel street furniture items actually encouraged more people to visit the urban center and support the businesses based in that area. There were a number of reasons why this benefit was achieved including;

a. The stainless steel street furniture items were not damaged to the same extent making the urban center look consistently attractive. This modern and timeless urban image was cited as a key reason for wanting to spend time in the urban center.
b. The design of the benches and seats using stainless steel bar products delivered several user benefits including;
    1. The benches and seats were quickly usable again after rainfall. The rain quickly drained off the bar products which dried quickly.
    2. The items did not get 'overly hot' in the summer months as the heat from the sun was dissipated by the bars quickly.
    3. The items did not become 'overly cold' in the winter months as the air around the bars provided a level of insulation.

Whilst the damage to the Stainless Steel street furniture was 40% lower than that for the Coated Carbon Steel street furniture, it presented an opportunity to target the education of the contractor teams working in the urban center. Through the adoption of Stainless Steel the damage rate dropped to a manageable and improvable level and was primarily aligned to one street furniture product, namely the waste bins.

# Conclusions

There is no doubt that selecting stainless steel for urban street furniture is a game-changer. Stainless steel provides many benefits to urban settings which includes

a. Increasing the attractiveness of urban centers which in turn brings more people into these areas and supports growth of the local economies.
b. Despite the higher initial cost of stainless steel street furniture the ongoing replacement and repair spending reductions payback quickly and stainless steel also offer long service lives well in excess of the original assessment period 15 years.
c. There is no need to consider changing stainless steel street furniture as a perceived mechanism to modernize urban centers as stainless steels always offer a stunning, timeless and modern appearance which few other affordable and economic materials can match.
d. Resilient materials like stainless steel will instantly reduce the needed repairs to street furniture due to their resistance to corrosion and natural material degradation. Furthermore, the cost of removing graffiti from stainless steel is the lowest of all materials and the graffiti is always easy to remove unlike other materials.
e. The design of street furniture is important to maximise the usability of all

items as the weather varies. The choice of stainless steel as a street furniture construction materials, supports the adoption of simple and novel designs that bring the following user benefits.

1. The street furniture items don't retain water and snow after local precipitation
2. The street furniture items do not get overly hot during spells of very hot weather.
3. The ability to easily contour the street furniture products provides good levels of comfort for users.
4. The choice of stainless steels as construction materials for street furniture makes the items easy to identify within any urban setting.

f. The evidence available shows that stainless steel street furniture also gives an instant reduction in the destruction of street furniture which in itself provides a platform for further reduction of destruction by focusing on the primary reason which is associated with urban contractor behaviour.

The cities that have already adopted stainless steel for their street furniture have no intention of returning to non-resilient materials because of all the above listed benefits.

As one urban administration planning manager stated …. "Stainless steel street furniture is essentially the 'fit and forget' option. It simplifies my role and allows me to use my annual budget more effectively and much more wisely."

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