

# ATLAS

## A BACKREST FOR EVERY BENCH

*A portable, retrofit backrest that turns almost any flat bench into a supportive chair, and folds to a pack you carry on your back*

---

### From pack to perch



*Carried like a backpack; deployed in under a minute; leaves no mark on the bench.*

### White Paper

Version 1.0, 2026

Srinivas Kasturi

# Contents

Executive summary	3
1. The problem	3
2. The solution	4
3. Under the hood	5
4. Where it serves	6
5. In practice	7
6. Design principles	8
7. How this differs	8
8. Intellectual property	9
9. Roadmap	9
10. Conclusion	10
Appendix A: Glossary	10
Appendix B: Important notices	10

## Executive summary

Most public seating has no back. Park benches, train-platform seats, stadium bleachers, harbour walls, picnic tables and waiting-room rows ask the body to sit upright and unsupported for as long as a person stays. For anyone with back pain, for older people, for those recovering from injury or surgery, for pregnant women, or for anyone who simply wants to linger a while, a backless bench quietly sets a time limit on comfort.

The usual answer is to bring a chair: a folding stool, a stadium seat, a camping chair. But these are bulky and heavy, they replace a perfectly good seat instead of improving it, and they leave a person carrying a whole chair for the sake of a backrest.

Atlas takes a different approach. It is a backrest, not a chair. It clamps to the back edge of almost any bench and expands into a firm, gently reclined back with armrests, steadied by two legs that reach the ground. When the visit is over it collapses to a flat pack with an integrated harness, so a person carries the backrest, not a chair, and the bench itself provides the seat. This paper sets out the problem, the design of the device, the settings it serves, and how it differs from what exists today. The methods described here are the subject of a patent application filed by the inventor, Srinivas Kasturi.

### 1. The problem

**Seats without backs.** The majority of seating in public space is a flat plank or slab. It is cheap to build, easy to maintain and hard to vandalise, but it gives the spine nothing to rest against. The longer a person sits, the more the back, shoulders and neck carry the load that a backrest would otherwise take.

**The portable-chair tax.** Existing portable seating replaces the seat entirely. Folding chairs, stadium seats and camping stools are heavy and bulky, they take a while to set up, and a person ends up carrying a full chair when the only thing missing from the bench was support for the back.

**Unstable clamp-ons.** The few backrests that attach to a bench tend to rely on the back edge of the seat alone. A back edge is rarely designed to take a reclining load, so such devices feel precarious, are limited to a narrow range of bench shapes, and can lever themselves loose when a person leans into them.

**The carry problem.** Anything brought to a bench has first to be carried to it, often over a distance, sometimes alongside bags, children or a dog. A comfort device that is awkward to carry simply stays at home.

**Leaving a trace.** Public seating is shared. A good attachment must hold firmly while in use and then leave the bench exactly as it was found, marking neither the wood nor the metal and leaving nothing behind.

Across all of these the pattern is the same. **Public seats give the body nowhere to rest, and the alternatives ask a person to carry, and wrestle with, a whole chair for the sake of a back.**

### 2. The solution

Atlas answers each of these problems. It improves the seat that is already there rather than replacing it, it carries like a small pack, and it is steadied to the ground rather than hanging off a bench edge.

## **2.1 A backrest you carry, not a chair you haul**

Atlas provides only what a bench lacks: a back, and arms to rest on. The seat is supplied by the bench. Because the heaviest, bulkiest part of any chair, the seat and its supporting structure, is left to the bench, what a person carries is a fraction of the size and weight of a portable chair.

## **2.2 Clamps to almost any bench**

Two clamps grip the back edge of the seat, joined by a cross-member that telescopes sideways so that the span adjusts to benches of different widths. The clamp faces are lined to protect the bench surface and to grip without marking it. The range of adjustment covers the great majority of slatted and solid public benches.

## **2.3 A frame that telescopes, locked by gas springs**

From the clamped base, the frame rises and reclines. The uprights, the cross-bars, the side rails and the arms all telescope, so the same device packs flat yet extends to a full-sized back. Each telescoping joint is held by a pneumatic locking gas spring released by a button, the same proven mechanism that holds an office-chair column or a tailgate strut, so adjustment is one-handed and the lock is firm and silent.

## **2.4 Two legs to the ground for stability**

Rather than trusting the bench edge alone, Atlas drops two support legs to the ground behind the bench. The legs meet at a pivot and are tied back to the clamps by bridge members, forming a braced triangle. A person can lean into the back with confidence because the reclining load is carried down to the ground, not levered against the seat.

## **2.5 Armrests that bear on the seat**

The arms telescope forward and carry small feet that rest on the bench seat itself. The arms therefore do more than support the forearms: they transfer part of the load directly onto the seating surface, spreading it and adding to the overall steadiness of the assembly.

## **2.6 Folds flat, carried like a pack**

When every telescoping section is collapsed and the legs are folded in, Atlas becomes a flat package. An integrated harness lets it be worn on the back, so it travels hands-free to wherever the next bench happens to be.

# **3. Under the hood**

## **3.1 The clamp system**

The base of the device is a pair of C-clamps connected by a laterally telescoping cross-plate. The C-clamps close onto the back edge of the bench seat; the cross-plate sets the distance between them to suit the bench. Because the clamps are the single point at which the device meets the bench, they are sized generously and lined to hold firmly on timber, metal or composite without damage.

## **3.2 The telescoping frame and pneumatic locks**

Above the clamps, a ratchet hinge sets the recline angle of the back. From the hinge, the structure is built from nested telescoping members: vertical uprights, a set of horizontal cross-bars that form the

back, telescoping side rails, and telescoping arms. Every extending member is held at its chosen length by a pneumatic locking gas spring with a button release. The gas spring both assists extension and locks the section in place once set, giving smooth, one-handed adjustment and a positive hold under load.

### 3.3 The support legs and bridge members

Two ground-bearing legs are pivotally connected to one another at their upper ends and tied to the clamp assembly by bridge members that meet the structure roughly one third of the way down from the top. This geometry turns the back, the clamps and the legs into a single braced frame, so that the force of a person leaning back is resolved into the ground rather than concentrated at the bench edge.

### 3.4 The fold geometry and harness

Each telescoping member retracts into the next, the arms fold against the back, and the legs swing in against the frame, so the deployed structure reduces to a flat, slab-like package. An integrated harness is built into the back face of that package, so the collapsed device is worn and carried like a slim rucksack. No separate bag or case is needed.

## 4. Where it serves

Atlas is designed for the ordinary places where people sit on backless seating and wish they did not have to.

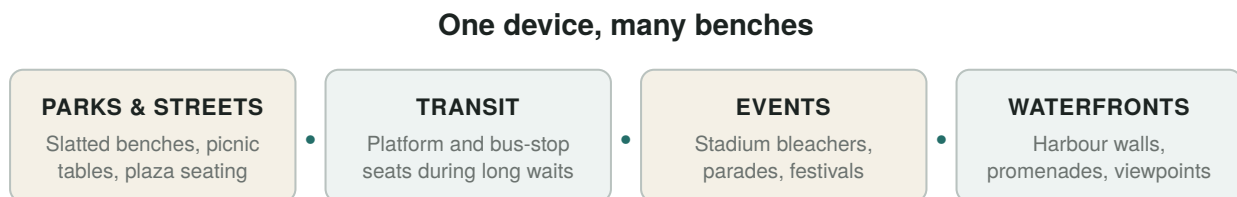


Figure 1. Atlas improves seating that already exists, across the settings where people sit longest.

### 4.1 Who benefits

The device is for anyone for whom an unsupported back is the limiting factor on sitting comfortably: people living with chronic back pain, older people, those recovering from injury or surgery, pregnant women, and the simply weary who want to watch a match, a sunset or a child's football game from beginning to end. Because Atlas adds a back to existing seating rather than providing its own seat, it suits people who want comfort without the burden of carrying and managing a full chair.

### 4.2 A family of forms

The same architecture supports variants. Clamp jaws can be tuned for slatted park benches, flat stadium benches or rounded rails. Back height, recline range and arm length can be offered in different sizes. Finishes and materials can range from a light everyday version to a more rugged outdoor build, all sharing the core telescoping, clamping and bracing design.

## 5. In practice

**The commuter.** Ravi faces a twenty-minute wait on a backless platform bench every morning. He unclips Atlas from his back, clamps it to the bench, releases two buttons to raise the back, and reads in comfort until the train arrives. It folds away before the doors open.

**The grandparent.** Margaret spends long afternoons watching her grandchildren at the playground, where the only seating is a slatted bench. Atlas gives her a supported back and arms to push up from, so an afternoon out no longer costs her an aching back that evening.

**The traveller.** Sofia sightsees all day and rests wherever she can. A harbour wall, a museum bench, a step in the shade: Atlas turns each into a proper seat for as long as she wants to take in the view, then rides on her back to the next stop.

**The fan.** Tom watches non-league football from hard stadium bleachers. With Atlas clamped to the bench in front of him braced to the ground, he has back support for the full ninety minutes, then packs it down and walks out hands-free.

## 6. Design principles

- **Retrofit, not replace:** improve the seat that is already there rather than carrying a whole chair to sit on.
- **Carry the backrest, not the chair:** by leaving the seat to the bench, the device folds to a fraction of a chair's size and weight and is worn like a pack.
- **Stable by design:** reclining loads are carried to the ground through braced legs, not levered against a bench edge.
- **Leave no trace:** lined clamps hold firmly in use and leave the shared seat exactly as it was found.
- **Honest about the landscape:** portable chairs and clamp-on backrests already exist. The contribution here is the specific combination of a carried, retrofit backrest, telescoping gas-spring structure, ground-bracing legs and seat-bearing arms.

## 7. How this differs

The table below sets common approaches today against the design described here. It aims to be fair rather than complete, and the features of other products vary.

Dimension	Common approaches today	Atlas
Form	A full portable chair with its own seat	A backrest only; the bench provides the seat
Weight and bulk	Heavy and bulky to carry and store	Telescopes to a flat pack worn on the back
Attachment	Freestanding, or strapped to a bench edge	Clamped to the bench and braced to the ground
Stability under recline	Limited; can tip or lever loose	

Dimension	Common approaches today	Atlas
		Load carried to ground through braced legs and seat-bearing arms
<b>Adjustment</b>	Fixed, or fiddly multi-step setup	One-handed, button-released gas-spring locks
<b>Effect on the seat</b>	Replaces it, or may mark it	Improves it and leaves no trace

## 8. Intellectual property

The design described in this paper, namely a portable retrofit backrest that clamps to existing bench seating, telescopes from a flat-pack form by means of pneumatic locking gas springs, and is braced to the ground by support legs while its arms bear on the seat, is the subject of a patent application filed by Srinivas Kasturi with the United Kingdom Intellectual Property Office. This paper describes the device at the level needed to understand it; it does not grant any licence.

## 9. Roadmap

**Phase 1, the core product.** A single, well-made everyday version covering the most common bench types, with the full telescoping, clamping, bracing and harness design.

**Phase 2, variants.** Additional sizes, clamp jaws for further bench shapes, and a choice of finishes and materials, from a light everyday build to a rugged outdoor one.

**Phase 3, refinement.** Weight reduction, faster deployment, and accessories such as a headrest, a cushion that clips to the seat, and weatherproof options.

Dates and scope are indicative and will be confirmed as the project develops.

## 10. Conclusion

A bench is half a chair. Atlas supplies the other half and carries it for you. By clamping to seating that already exists, expanding from a flat pack on proven gas-spring locks, and bracing itself to the ground, it gives a supported, comfortable place to sit wherever there is a bench, and then folds away onto your back. It sets out to make every bench a chair, on the sitter's terms.

## Appendix A: Glossary

### **Retrofit backrest.**

A back support added to existing seating rather than a complete replacement chair.

### **Pneumatic locking gas spring.**

A sealed gas strut that both assists movement and locks at a chosen length when a release button is pressed, as used in office-chair columns and tailgate struts.

### **Bridge member.**

A structural tie that connects the support legs to the clamp assembly to form a braced frame.

**Ratchet hinge.**

A hinge that holds a set angle through a series of stepped positions.

## Appendix B: Important notices

This document is for information only and describes intended design and direction. It is not an offer or solicitation to buy or sell any product or instrument, nor a promise of future features, availability or returns, nor legal, financial or investment advice. Statements about future plans are forward-looking and may change. Trademarks and product names of third parties belong to their respective owners and appear here only for comparison. The methods described are the subject of a pending patent application, and nothing here grants any licence.