

## RECODE THE ROAD - A Living Infrastructure for Soil, Ecology and Movement

### 1. Site Localization. A technical, fragile, traversable landscape

The site unfolds along the **L202**, a linear **road infrastructure** that connects the centers of **Bregenz, Hard, Fußach, and Höchst**, situated at the edges of **Lake Constance** and the **Rhine Delta**. But this linear geography is just a surface: what emerges, when observing the territory with the “**deep gaze**” is a **layered landscape**—one made of **tensions** and **discontinuities**, a **living section** where **mineral, hydrological, biological, and infrastructural** components intersect and overlap. Along the L202, often **conflicting dynamics** converge:

- An **agricultural landscapes** that survive in **fragments**;
- A **delta** that is protected yet **incised**;
- An **industrial fabric** that retracts or transforms;
- Some **wooded areas** seeking **ecological continuity**;
- A **fast mobility** infrastructure that cuts through but fails to **connect**.

The **identity** of this site is not defined by its **shape or position**, but by what is happening **beneath and around** it: the **erosion of agricultural soils**, **anthropic pressure** on **wetland systems**, the **loss of accessibility** at the edges, and the impact of **climate change** on the **water cycle** and **plant systems**.

Within this complex section, the **L202** is not simply an **object**, but a **gesture** that has **reshaped the landscape**. It is a **line** that pretends to be **neutral**, yet generates **deep material and immaterial effects**. The site is not a **perimeter**, but a **line of crisis**. And it is precisely from this **fragility** that the project draws its **strength**: to read the **L202** not as a **functional axis** to be improved, but as a **margin to be reactivated**, a **threshold to be re-coded**, a **hinge to be traversed**. “Recode the Road” is not merely a mitigation of infrastructure’s impact; it becomes an active ecological stitching device. It reconnects a set of matrix habitats that structure the landscape of the Rhine Delta and Lake Constance. Though now fragmented, these habitats represent a vital ecological heritage. Their functional continuity is reimagined through the L202, transformed into a linear ecological corridor. The area between the Rhine delta and the shores of Lake Constance forms a highly complex **ecotonal system**, where **fluvial, lacustrine, marshland and agricultural environments** intersect, generating **dynamic ecological gradients**. These **ecotones**—natural and semi-natural edges—act as high-biodiversity interfaces, hosting **specialized plant and animal communities** and strong seasonal variability.

#### H1. Open waters (lake, canals, river mouth)

Water is the primary matrix of this landscape. Lake Constance, irrigation canals, ditches, and the Rhine mouth form a fluid, dynamic system—under increasing threat from urban pressure and surface sealing. **The project protects these spaces as both anchors and hinges of the ecological network, with overlooks, filtration edges, and lightweight platforms** enabling new human-water interaction.

#### H2. Reeds and marshes

Marsh edges and reed beds hold exceptional biodiversity, often invisible in conventional landscapes. The project **strengthens their connectivity through ditch restoration**, reintroduction of hydrophilic species, and creation of vegetated buffer strips that filter runoff and provide wildlife habitat.

#### H3. Wet meadows, peatlands

These remnants of agrarian-ecological heritage are among the most endangered. The project treats them as **spaces of slowness and transition**: widened roadside zones managed with delayed mowing and low-impact planting, allowing coexistence between human use and ecological succession.

#### H4. Wooded bands, riparian forests

Tree-lined river edges are key ecological structures. The proposal strengthens them through tree rows and linear micro-forests that span across the L202, **creating “vegetal bridges” that enable wildlife passage and climate resilience**.

#### H5. Agricultural fields, edges, hedgerows

The traditional agrarian landscape—marked by irregular edges, hedgerows, and buffer fields—is under threat from homogenization. The project calls for an ecological reinterpretation: **agricultural margins become biodiversity corridors, sometimes reshaped as community gardens, orchards, or productive rows, reweaving community ties into the landscape**.

## 2. Decoding the Infrastructure: The Road as Threshold, Not Axis

In the new project framework, the L202 is reconfigured as the **sixth habitat**: a multifunctional ecological infrastructure integrating environmental devices, slow mobility systems, and ecosystemic functions, enhancing territorial connectivity and landscape resilience. The **L202** is a **high-efficiency linear infrastructure**, engineered for **fast throughput** across the flatland. Its **vectorial layout** appears **neutral and rational**, yet no infrastructure is ever truly neutral: it **inscribes and alters**. The L202 has **fragmented** what once formed **ecological continuities**—**wetlands, permanent grasslands, agricultural plots, and riparian forests**—now reduced to **marginal remnants**.

**As direct intervention on the roadway of the L202 is not permitted, the project operates within the interstitial and marginal areas flanking the infrastructure**, reimagining them as active zones for environmental mitigation, ecological connectivity, and social activation. These residual spaces—often underused or degraded—are redefined as **functional and ecological corridors**, accommodating vegetative buffers, micro-topographical adjustments, and low-impact programmatic uses, thus contributing to landscape regeneration and territorial resilience.

Where once the **landscape's lateral flows** were uninterrupted, they now collide with an **impermeable asphalt interface**. Our project reframes this rupture as an **operative potential**. We no longer read the L202 as a **longitudinal connector**, but as a **transversal interface**—a **multifunctional ecological and productive hinge**, embedded within a **territorial system of flows**. The land adjacent to the roadway is **not residual**, but a **disconnected network of ecological services**, waiting to be **reintegrated**. Though ecological corridors persist, they are **disaggregated**: **truncated hedgerows, interrupted swales, and choked faunal passages**.

To walk along the L202 becomes an act of **environmental literacy**—inhabiting a **relational matrix** of **seasonality, care, biological productivity, and place-based memory**. The **spatial interface** shifts: the road becomes an **activated platform**, punctuated by **ecological modules**—shaded micro-habitats, **stormwater retention cells**, and **field-access nodes**. The **green infrastructure** is not ornamental, but **structural**, enabling **inter-species connectivity, bioclimatic resilience, and adaptive reuse of space**. The L202 is **not mitigated**, but **transcoded**—converted into a **green spine** of **environmental computation**, able to **host life, modulate hydrological regimes, and support low-carbon mobility**.

The road could become a **responsive linear system, hybridized, reversible, sensorial, and biocompatible**. It **absorbs rather than resists, connects rather than severs**. A **landscape protocol** that **rewrites the infrastructural grammar**: transforming a mono-functional system into a **multi-scalar ecological interface** that reestablishes **depth, permeability, and territorial meaning**.

**The landscape is not the backdrop of the intervention—it is its performative engine.** The design does not begin with the morphology of the road, but with a systemic reading of the environmental matrix that surrounds, permeates, and reacts to the infrastructure. The landscape is adopted as a **design protocol**, a platform for decoding and reprogramming the L202 as an adaptive and hybrid system. The project avoids the design of isolated objects and instead constructs **territorial devices**—systems that interface with hydrodynamic patterns, geotechnical structures, and socio-ecological cycles. This logic is organized through three intertwined operational layers:

### S – Actions: Solid

#### **Topological surfaces, structural substrates, and geospatial geometries.**

The design addresses the **material infrastructure** of the corridor: the **asphalt layer is reduced, reconfigured, and perforated**. Edge zones are **graded and contoured** using in-situ soil, enabling **surface water management** and **micro-topographic diversification**. The intervention introduces **pervious materials**, such as **geocells, stabilized aggregates, porous pavements, and bio-based composites**. The solid layer functions as a **load-bearing platform** for ecological and programmatic retrofitting.

### F – Actions: Fluid

#### **Hydrological logic, runoff dynamics, and atmospheric integration.**

The road ceases to be a barrier to hydrology and becomes an **active water-sensitive infrastructure**. Existing **ditch networks, bioswales, and depression zones** are reactivated or reengineered to create a **multiscalar retention system**. **Constructed wetlands, vegetated infiltration trenches, and attenuation ponds** are embedded within the road's cross-section. Stormwater is choreographed as a **temporal and experiential event**, exposing seasonal rhythms and ecological cycles. The fluid register brings **resilience, delay, and visibility** to water flows.

### B – Actions: Biotic

### **Living systems, agroecological layers, and successional dynamics.**

The biotic register activates the site as a **biosocial interface**. Roadside verges and median strips are transformed into **biodiversity corridors**, integrating **native planting palettes**, **pollinator strips**, and **adaptive vegetation zones** calibrated to edaphic conditions. Spaces are allocated for **agroforestry**, **productive hedgerows**, and **low-maintenance urban agriculture**, co-managed by local actors—schools, community cooperatives, and land stewards. Biodiversity is deployed not as mitigation, but as a **productive algorithm** shaping ecological intensity and ecosystem services.

These three registers are not isolated: they **superimpose, hybridize, and co-evolve** across every spatial node. Each micro-intervention becomes a **component of a systemic retrofit**, where landscape functions as a **spatial operating system**, responsive to pressure, friction, and feedback. The output is neither a conventional greenway nor a generic slow mobility corridor. It is a **multifunctional landscape infrastructure** that **absorbs, filters, cultivates, and narrates**—a **replicable territorial framework** capable of **translating infrastructural space into a metabolically active and socially embedded environment**.

The diagram functions as a **synoptic map of integrated interventions along the L202**, establishing a replicable system of **adaptive territorial devices**. The **red trace** indicates the route of **existing cycle lanes**, enhanced by a **smart surface-based signage protocol**: a low-impact codification that increases visibility and accessibility without major civil works. **Tree rows** (green icons) operate as **modular environmental mitigation units**, strategically positioned to reduce **road-related acoustic impact** while reinforcing the **ecological stratification** of the road's edge. Based on **GIS acoustic pollution datasets**, the placement and density of the tree rows follow a **data-driven logic**, targeting high-impact zones (solid green dots). **Ecological corridors** are translated into **dynamic patterns**, adjustable to local conditions and scalable across the territory. Integrated **dashed cycling paths** act as **secondary connective infrastructure**, linking fragmented nodes of ecological, social, and productive relevance.

At intersections with the primary road, the bike lanes are **expanded into multifunctional buffer zones**, designed to host **slow mobility, ecosystemic devices** (e.g., wetlands, bioswales, community gardens), and temporary infrastructures. These **adaptive sections** function as **ecological and infrastructural hubs**, suitable for replication in similar landscapes. The entire system acts as a **scalable design protocol**: a grid of interoperable soft interventions that trigger **progressive regeneration processes** along linear infrastructures in peri-urban and rural contexts. Through the convergence of **passive mitigation, ecological connectivity, and programmable signage**, the project defines a **new environmental infrastructure platform** for the 21st-century landscape.

Noise reduction along the L202 is not tackled through artificial sound barriers or isolated interventions, but rather through a **diffuse and integrated environmental mitigation strategy**, embedded in the landscape design. **Tree rows**—arranged continuously or in modular segments along the roadside—serve as **natural sound-absorbing buffers**, dampening vehicle noise propagation and improving ambient comfort for nearby zones.

The use of **native tree species with dense canopies and persistent foliage** ensures year-round effectiveness, including in winter. In the most exposed sections (e.g., higher traffic volumes, proximity to sensitive areas, GIS-based noise analysis), these buffers are **intensified and combined with mixed hedgerows**, generating **layered vegetative filters** with high acoustic absorption capacity. These actions are supported by **soil reshaping and edge reconfiguration**, introducing **microtopography, berms, and earthen sculpting** that reduce sound reflection and enhance absorption through both vegetation and terrain.

### **3. Nodes: Local Devices for Systemic Transformations**

The project does not act uniformly along the entire route. The L202 is too long, too articulated, too heterogeneous. For this reason, the strategy focuses on selected **nodes**—specific points where **territorial tensions** become more visible and where **small-scale interventions** can trigger **large-scale effects**. These nodes do not correspond to traffic junctions or intersections. On the contrary, they **emerge from the landscape**: places where the infrastructure bends, widens, intersects with fragile elements such as waterways, agricultural margins, or dispersed settlements. Each node is conceived as an **intensive section**, where the three design registers—**solid, fluid, biotic**—converge, transforming the road into something else.

Each node is not only a variation of the road cross-section, but also a **narrative episode**, telling a different way of inhabiting the infrastructure: as a place for exchange, contact with nature, and **shared stewardship**. Their distribution is not symmetrical but responds to **voids, latent opportunities, and landscapes to be reactivated**. The nodes thus become **replicable design matrices—minimal yet transformative grafts** capable of introducing **rhythm and porosity** to an infrastructure originally conceived for continuity.

### *Node Höchst – The Ecological-Recreational Threshold - Reconnecting farmland and swamp forest, weaving infrastructure into daily life*

In southern Höchst, the L202 slices between the **agricultural land to the west** and the **swamp-forest to the east**, bisected by an industrial zone. Here, an **existing green corridor—served by a cycle path—abruptly ends**, leaving a key ecological passage broken.

Our proposal reconnects the landscape on multiple levels:

- **Terrace mounds** created by shifting turf from the road edges to form a textured buffer, absorbing noise and shielding adjacent vegetation.
- **New tree copses** of native species acting as green barriers to screen sound and pollution.
- A **natural playground** inserted into a former weedy area, with wooden seating, gentle earth berms, and canopy formed by young and mature trees.
- The existing **parking lot** is reimagined as a **low-maintenance fruit orchard**, seamlessly connected to cycling and walking paths leading toward the marsh.

Here, the L202 becomes a **porous passage**, a threshold where infrastructure meets recreation and ecology, not a barrier. “Here the road does not divide—it filters. The roadside becomes fertile, and infrastructure invites play and harvest.”

### *Node Fußach – The Urban Threshold - Redefining the entrance: margins as meeting places*

At Fußach, the L202 **splits**, forming the main route along the delta and the access to the town center, anchored by the **Despar supermarket**, a local hub. Between these lanes, **patches of neglected green**—grassy triangles, verge strips, empty parking edges—persist. The proposal transforms these into **pocket parks** and a **shared space** for cars, bikes, and pedestrians, erasing traditional hierarchies of mobility. A new **paved pattern, low landscaping, and horizontal taming** create a recognisable threshold into Fußach. These minimal green pockets—**benches, gnarled trees, gravel clearings**—allow informal gatherings and slow movement. The L202 is no longer just a road. “This node is not an intersection—it is the moment the road becomes town.”

### *Node Hard – The Wilding Infrastructure - Reconnecting school, watercourse, and lakeshore*

In Hard, the L202 interrupts a vital ecological corridor stretching from the **school + train station in the north** to the **Lake Constance shoreline in the south**—lined by a natural watercourse. Today, infrastructure severs this flow.

The strategy: **let it grow**. Spreading species are planted in the **buffer zones** at the verge, weaving back the L202 into the green corridor. Vegetation envelops the roadside, making the road **gradually wild**. A **horizontal signage system**: symbols, leaf impressions, and textures slow the car flow and cue potential wildlife passages. The **cycleway is extended** along the approach to the station, reworking the **Lidl parking lot** into a temporary installation site—a seasonal green ground for events. Here, nature is not ornament—it **reclaims time**, turning the road into a **permeable membrane** for water, vegetation, animals, and people. “To let it grow is a design choice. To wild is care.”

### *Node Bregenz – The City’s Green Portal - Framing entry through water, vegetation, and slow mobility*

At the bridge entrance to Bregenz, the L202 meets the urban core. This once purely functional passage becomes a **welcoming green gateway**, a dialog between the **new left-side tree canopy** and the **historic built frontage on the right**. The pedestrian zones are reorganized: **expanded cycle paths, permeable paving, and clear wayfinding** support shared movement modes. The **watercourse** is activated through **wooden boardwalks**, viewing platforms, and ramps, allowing people to pause, interact, and trace the natural flow toward the lake.

We propose also strengthening a **pedestrian route parallel to the L202**, lined with historic façades, offering an intimate, character-rich alternative to the main road, adding a **mosaic of urban thresholds**. “Urban landscape begins with a planting gesture. Entry is not signage—it’s a space that slows us down.”