CUMNOCK ACTIVE TRAVEL NETWORK

CHANGING BEHAVIOR AND INFRASTRUCTURE TOWARDS LOW CARBON TRANSPORT

NEED FOR A NETWORK

28% Scottish GHG emissions are from transport

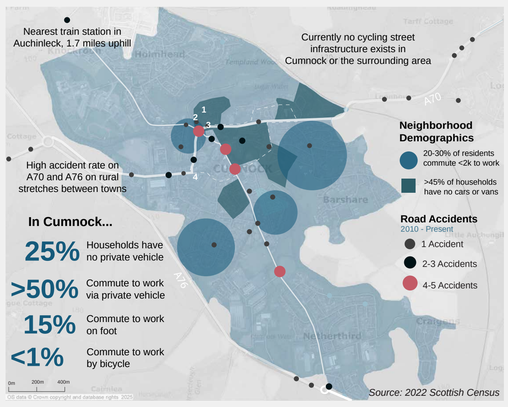
40% East Ayrshire emissions are from transport

50% East Ayrshire trips are less than 2 miles

Domestic transport is the largest share of Scottish emissions so shifting away from private vehicles is pivotal to achieve net zero. For active travel to have wide appeal, a holistically designed **network of connected, safe, and convenient routes** protected from vehicle traffic is needed. A town-wide active travel system, from separated bikeways with space for future capacity to human-scale neighborhood streets, can move transport emissions towards net zero.

Source: East Ayrshire Council Transport

TRANSPORT ANALYSIS

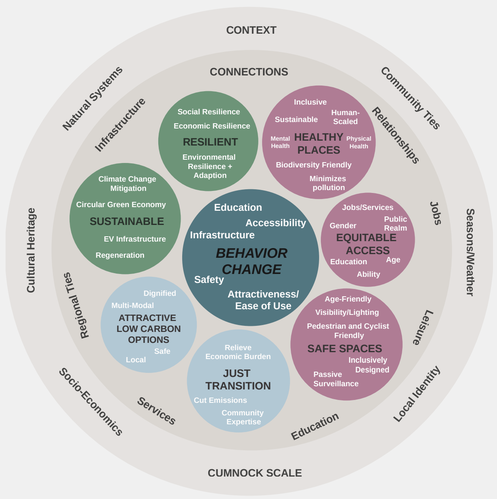


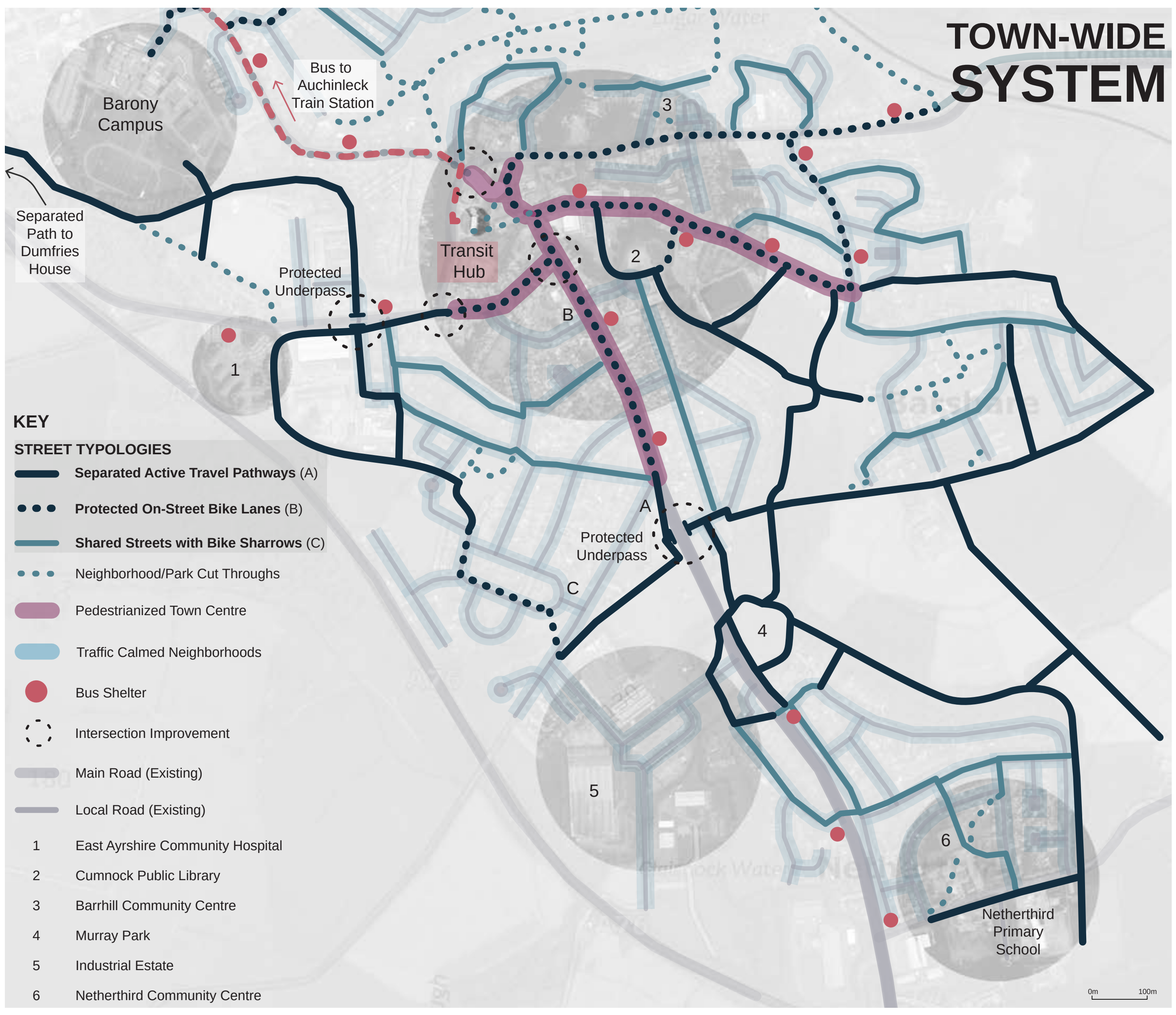
JUST TRANSITION

Provide safe and affordable car-free transportation regardless of user age and socio-economic status for local trips with integration to regional connections. Equitable access to services, education and employment.

CHANGING BEHAVIOR

User safety, equitable access, community buy-in and accessible education are key to designing an easy to use network that residents will embrace.





STREET TYPOLOGIES

As called for by the East Ayrshire Active Travel Strategy and CoRE program, there is **community interest in active travel**, but current infrastructure is lacking. New street design is based on street width, expected usership levels, and neighborhood context. The main typologies focus on protected bike highways, shared roadways, and neighborhood streets. This provides guidelines for dimensions and layouts while being **adaptable and scalable** based on space availability and local need.

SEPARATED PATHWAYS (A)

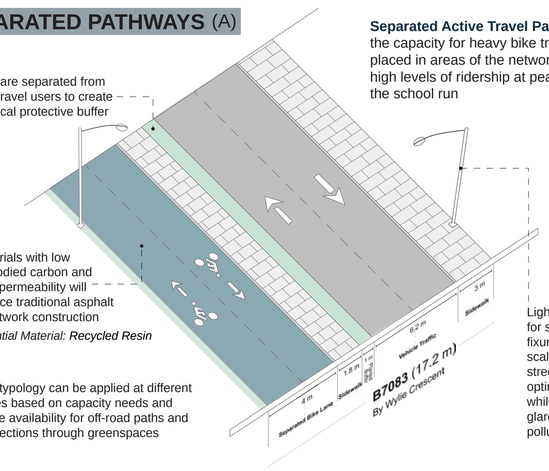
Separated Active Travel Pathways have the capacity for heavy bike traffic and are placed in areas of the network that see high levels of ridership at peak times, like the school run

Roads are separated from active travel users to create a physical protective buffer

Materials with low embodied carbon and high permeability will replace traditional asphalt in network construction

Potential Material: Recycled Resin

This typology can be applied at different scales based on capacity needs and space availability for off-road paths and connections through greenspaces



Lighting is critical for safe travel and fixures should be scaled to specific street typologies to optimize visibility while minimizing glare and light pollution

PROTECTED ON-STREET (B)

Even, uncracked pavement increase permeability and walking accessibility for older adults

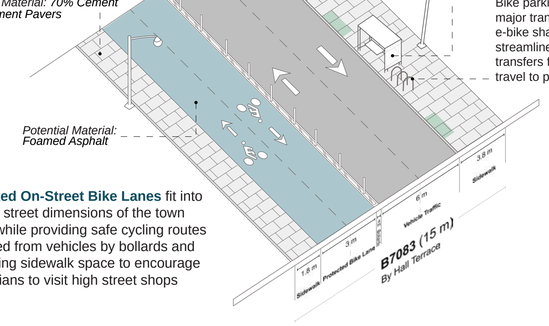
Potential Material: 70% Cement Replacement Pavers

Reclaimed building materials can be used to construct new bus shelters and benches

Possible Partner: Cumnock Remakery

Bike parking and, at major transit hubs, e-bike sharing docks, streamline multi-modal transfers from active travel to public transport

Potential Material: Foamed Asphalt



Protected On-Street Bike Lanes fit into existing street dimensions of the town centre while providing safe cycling routes protected from vehicles by bollards and expanding sidewalk space to encourage pedestrians to visit high street shops

SHARED STREETS (C)

With traffic calming measures, neighborhood roads can be converted to **Shared Streets With Bike Sharrows**

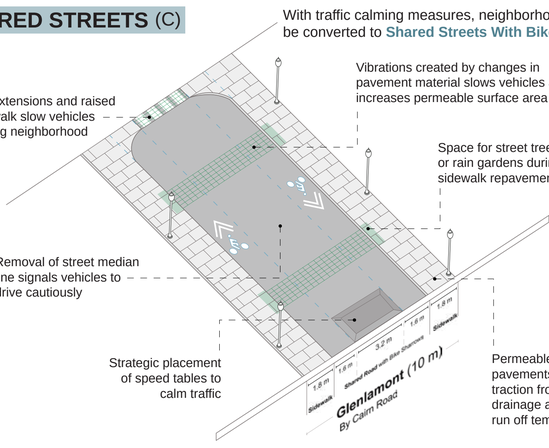
Curb extensions and raised crosswalk slow vehicles entering neighborhood

Vibrations created by changes in pavement material slows vehicles and increases permeable surface area

Space for street trees or rain gardens during sidewalk repavement

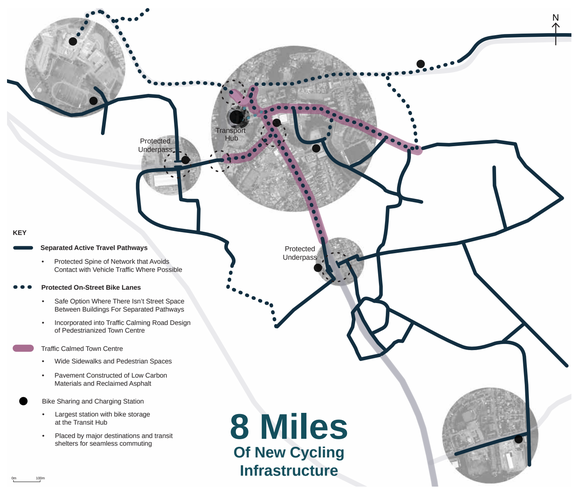
Removal of street median line signals vehicles to drive cautiously

Strategic placement of speed tables to calm traffic

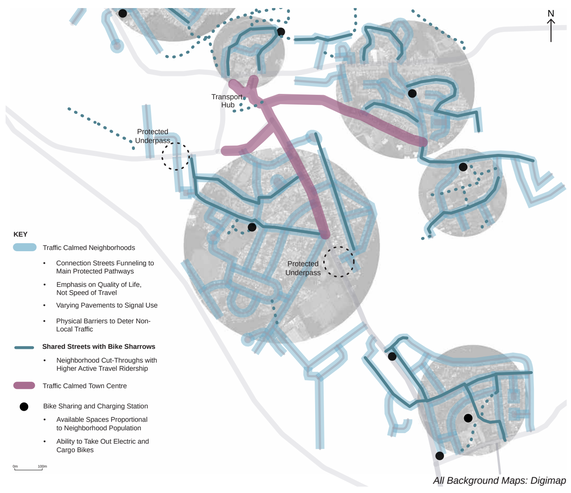


Permeable, cool pavements improve traction from water drainage and lower run off temperature

PRIMARY ROUTES



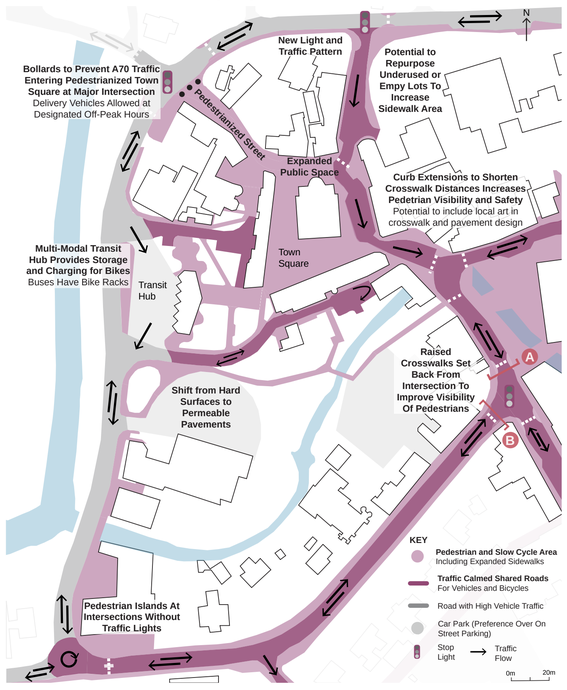
NEIGHBORHOOD CONNECTIVITY



All Background Maps: Digimap

REDESIGNED TOWN CENTRE

Shifting traffic hierarchy in the town centre to integrate cycle infrastructure, **increase public spaces** for pedestrians, and calm vehicle traffic can **improve the human-scale experience** and encourage higher foot traffic to local businesses.



LOW CARBON MATERIALS

Current Conditions	Foamed Asphalt	Recycled Resin	70% Cement Replacement* Pavers	Reclaimed Building and Road Materials
32.8 $kgCO_2e$ per m^2	*14.76 $kgCO_2e$ per m^2*	*0.654 $kgCO_2e$ per m^2*	*3.712 $kgCO_2e$ per m^2*	*0 $kgCO_2e$ per m^2*
Road asphalt laid hot in a high energy process Can be reused as reclaimed asphalt pavement (RAP)	High percentage of reclaimed road and buliding materials Cold construction reduces energy consumption	Porous surface helps manage stormwater runoff High drainage improves wheel traction on **bike pathways**	High durability Reduces landfill waste Increased permeability **Ground Granulated Blast Furnace Slag*	Minimizes new resources, waste, and additional embodied carbon emissions Locally sourced for **bus shelters**

Source: ICE Database V3

A DAY IN THE LIFE

CUMNOCK 2045

ERRANDS AROUND TOWN

Grandma was struggling after her husband passed away, so her grandson **Archie** moved in to help around the house. Like 35% of her neighborhood, she has long term health conditions, like visual impairment, and no longer likes to drive.

Not Buying A New Car Removes
5.6 Embodied Tonnes CO_2e
24 Lifecycle Tonnes CO_2e

Archie commutes to work at Dumfries House on shared e-bike from the bike docking and maintenance station. He used to feel unsafe alongside traffic during rush hour, but since the separate paths were constructed and vehicle congestion around the school decreased, he enjoys the ride.

80% Of Residents Feel Comfortable Biking Locally In Towns with Protected Cycle Networks

Grandma has a doctor's appointment and waits for the hospital shuttle at the nearest bus shelter. Now that the shelter has a nice bench, sufficient lighting, cover from rain and wind, and display screens with arrival times, she finds public transit more accessible.

Constructing New Bus Shelters from Reclaimed Building Materials Could Save
14.5 Tonnes From Landfills

Grandma has been going to the East Ayrshire Community Hospital for years. Her GP says her health is improving and to continue walking everyday to see greater health benefits, including lower chance of hip fractures and dementia.

An Increase of 1,000 Steps A Day Is Associated With A
15% Mortality Risk Reduction

Grandma runs into her friend on the bus ride home and they stop for lunch in the town centre. She used to hate walking home, but the pavement improvements and benches at each bus stop she passes allows her to stroll comfortably with well-placed seating breaks.

Public Transit Users and Active Travelers Spend
6 times More on High Streets Than Motorists

Archie bikes to the grocery store after work. Everything fits in the cargo e-bike basket. He even has room to pick up some flowers for the front yard. The former parking lot was redesigned as a garden shop as fewer residents needed their cars for local trips.

Redesigning Neighborhood Streets and Sidewalks with Permeable Materials Results In a
46% Decrease in hard paved surface area

Sources: See Booklet

THE NEW SCHOOL RUN

The school bike train takes students on separated paths and underpasses to the Barony Campus. Part of the car park was transformed into bike parking to meet demand. In school **Katie** learns about cycling safety then the class practices on bikes in the gym.

Katie and her **Mom** cycle on separated, off-road paths to meet the school bike train. Like 18% of their area, they're a single-parent household and car costs have been a burden. Selling their car and shifting to bikes has helped alleviate finances.

£3,500 A Year In Car Running Costs

86% Of UK Parents Agree: Bikeability Courses Improve Children's Confidence and Skills

After leaving **Katie** with the bike train, **Mom** parks her e-bike at the multi-modal Transit Hub to charge then heads to work in Kilmarnock on the shuttle bus to the Auchinleck Train Station.

By Taking Public Transit, Mom Removes
7,680 Miles A Year Of Journeys By Car

Since most students commute by bike or public transit, vehicle congestion decreased around school runs. After school, **Katie** and friends safely walk into the town centre to hang out in the pedestrian square. They securely park their bikes while they check out stores.

Local Retail Sales Increase By
30%+ In Pedestrian Improved Town Centres

Mom had to pick up more hours at work, so **Katie** goes to the library. **Mom** used to worry about busy intersections but with improved street design and school cycling education, she's now comfortable with **Katie** traveling on her own.

Improvements to Street Crossings Decreases Pedestrian and Driver Conflicts By
60%

Katie enjoys after school programming at the library. When **Mom** returns from work, she unlocks her bike from the renewable charging area, picks up some things from the hardware store, and heads to the library. **Mom** and **Katie** talk about their days on the bike ride home.

Shifting School and Work Commutes to Low Carbon Travel Reduces Their Household Carbon Footprint By
1.17 Tonnes A Year

Sources: See Booklet

SCALING IMPACT

HEALTH BENEFITS

Walking and biking, as opposed to sedentary car use, and public realm improvements increase social interactions and are linked to **physical and mental health benefits**, especially in older adults.

EVERY YEAR IN CUMNOCK:

21 Serious long term health conditions **PREVENTED**

Over £250M Saved by NHS Scotland

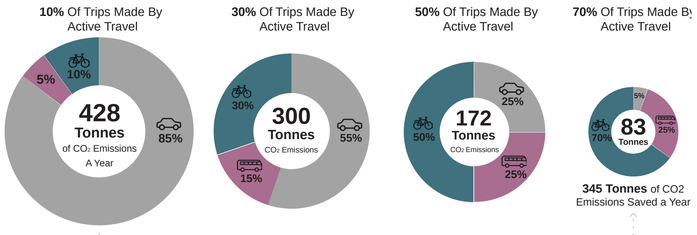
Air quality improves by **~1,000** kg of NOx

Source: Sustrans Walking and Cycling Index Scotland, 2023

SUSTAINABLE SCHOOL TRAVEL

Barony Campus: 2,100 Students Within 30 Minute Biking Radius and Staff

800,000 Trips Per School Year



345 Tonnes of CO2 Emissions Saved a Year

School run metrics are key due to the measurability of trips per year and the substantial impact on lowering carbon emissions. Even if they are local, families with cars will drive children to school if there is no safe and convenient option. The ability of the network to create appealing alternatives is critical to changing movement patterns and achieving net zero in a small-town setting.

Creating reliable and affordable transport alternatives to the Barony Campus, the largest school in Scotland and future home of the CoRE Centre, can give parents time back from the school run, save money on transport costs, create flexibility for after school activities, and encourage travel independence.

Active Travel
Public Transit
Private Vehicle

Source: Greenmatch UK

NET ZERO TOWN

Individual changes can scale up to have a profound impact on achieving net zero. If 60% of residents shift 4 trips a week from private vehicle to active travel, transport emissions can be reduced annually by roughly

15,000 Tonnes of CO_2

The Equivalent of **2,110 Flights** Round Trip from Glasgow to New York

Source: The Climate Change Mitigation Impacts of Active Travel (Brand et al.)

KIMBERLY O'KEEFFE

ADVANCED SUSTAINABLE DESIGN PROJECT 2024/2025 | JUST TRANSITIONS | CUMNOCK, EAST AYRSHIRE COUNCIL, SCOTLAND