

# Value for Money Assessment: Benefit-Cost Ratio

## Rationale for Intervention

The health of the main arterial east-west A44 corridor through Worcester is essential for access, growth and vitality of the City Centre. It is constrained by the river crossing, outdated junction designs, and poor facilities for pedestrian and cyclists. The Worcester Traffic Model confirms significant delays. Reference case journey times indicating these delays are given in Appendix 3. There are two AQMAs at St Johns (2014) and Dolday (2009) either side of the bridge and Deansway is expected to be an AQMA in the future. Two junctions have been identified for traffic signal upgrades through the Worcester Asset Management plan.

Status-quo will result in persisting congestion and around Worcester City Centre, Worcestershire's economic engine. Equally, depressed levels of sustainable active travel modes within the City Centre's immediate context area will continue, which further accentuates congestion. Additionally, failure to increase capacity within the City Centre will prevent it from achieving its full potential.

As such, investment is needed to reduce congestion on the City Centre's east-west axis. Reduced congestion, with increase in active-travel modes, will create additional capacity on the City Centre's highway network. This can facilitate the delivery of the emerging City Centre Masterplan, along with other measures, to maximise the City Centre's potential by intensifying development. No further development can be delivered within the City Centre in the absence of any capacity improvements.

This context presents the rationale for intervention within Worcester City Centre to reduce congestion, promote sustainable travel modes and create capacity to facilitate further development. This is the focus of the NPIF funded Worcester City Centre Network Efficiency (Axis West East) schemes. The schemes will deliver the necessary junction improvements and public realm enhancements, including walking and cycling infrastructure, at the four locations identified in the scheme's location plan in Appendix 1.

## Scope of Value for Money Assessment

This appendix presents additional detail on the value for money assessment prepared for the scheme. It brings together the present value benefits (PVB) created with transport economic efficiency (Appendix 3) and active mode appraisal (Appendix 4) to aggregate PVB for the scheme. The monetary benefits are compared against the present value of costs (PVC) detailed below, to calculate a benefit cost ratio which demonstrates the scheme's value for money.

## Scheme Benefits

Two WebTAG-compliant benefit streams have been identified through scheme appraisal: transport economic efficiency and active mode appraisal. Table 1 indicates that the aggregate PVB generated through these benefit streams is £26.1m (2010 prices). More detail on these benefits streams and derivation of individual PVB's is presented in Appendix 3 and Appendix 4 respectively.

Benefit Stream	PVB (£)
Active Mode Appraisal	7,086,736
Transport Economic Efficiency	19,002,531
<b>Aggregate PVB</b>	<b>26,089,267</b>

TABLE 1 AGGREGATE PRESENT VALUE OF BENEFITS (2010 PRICES AND VALUES)

## Scheme Costs

The total cost associated with delivering the scheme is expected to amount to £4.6m (2017 outturn costs), as listed in Table 2. The total level of investment includes the cost of construction, as well as design, prelims, risk and other additional items. The assumptions underpinning these additional items are also listed in Table 2.

Cost Item	Assumption	Value (£)
-----------	------------	-----------

across all cost streams, based on DfT guidance. The total stream of costs is also subject to the prevailing discount rates recommended by HM Treasury's Green Book, based on discounting to 2010 prices and values and a sixty-year appraisal period. In the PVC, construction investment is assumed to be distributed evenly across 2018 and 2019, with maintenance incurred from 2020. Replacement costs are incurred at twenty year intervals from the year opening, 2019. Based on this specification, the PVC for total scheme costs is estimated at £6.2m (2010 prices and values).

## Value for Money Assessment

Comparing the scheme's PVB against PVC reveals a benefit cost ratio (BCR) of 4.2, as demonstrated in Table 4. This presents very high value for money for public sector investment.

Value for Money Metric	Value
PVB	26,089,267
PVC	6,217,095
BCR	4.2

TABLE 4: VALUE FOR MONEY METRICS (2010 PRICES AND VALUES)

## Sensitivity Tests

Three sensitivity tests have been developed to assess the impact of small changes in key elements of the value for money assessment:

- Sensitivity Test 1: 20% increase in costs;
- Sensitivity Test 2: 20% reduction in benefits (as a result of delayed construction programme);
- Sensitivity Test 3: 20% increase in costs and 20% reduction in benefits.

The sensitivity test results presented in Table 5 demonstrate that even where scheme costs are higher than expected and/or scheme benefits are lower than expected, the scheme will still deliver high value for money for public sector investment.

Sensitivity Test	PVB	PVC	BCR
1: 20% increase in costs	26,089,267	7,460,514	3.5
2: 20% reduction in benefits	20,871,414	6,217,095	3.4
3: 20% increase in costs and 20% reduction in benefits	20,871,414	7,460,514	2.8

Table 5: Sensitivity Test Value for Money Assessments (2010 prices and values)