Region: Cornwall and Devon
Project ID: project 1
Impact of road improvement project near Cornwall and Devon

IFS Property Value Calculator

1 Introduction

2 Type of project

The project is a **road** transport improvement project in the **Cornwall and Devon** region. Figure 1 displays a map of the project area. The project area is approximately 2.385275×10^4 square kilometres. It is located near Cornwall and Devon. The project aims to reduce travel times to all destinations to 90 % of baseline travel times.

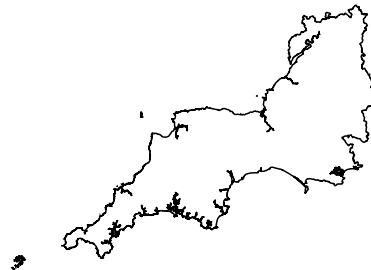**Map of travel improvement area**

Figure 1: Map of travel improvement area

To predict, new travel times for the region, this report assumes:

- House prices are determined by 1) property size and structure and 2) location. Details of the

data used to estimate the model are presented in Section 5. Model details are presented in Section 6.

- Location values are primarily determined by travel time to various destinations, land use in the surrounding area, distance to the coast, and various local amenities and disamenties including greenbelt status, and road noise.

- Travel times to 4 cities are the dominant factors for property values in this region. These cities are: (**Barnstaple, Exeter, Falmouth, Plymouth**).

- New travel times after the investment equal 0.9 multiplied by the baseline travel time for all properties in the area shown on the map.

- All travel times are estimated using Google Maps.

- The model does not account for changes in congestion or any other changes in travel time induced by the new road.

- The model provides short-run predictions only. In the long run, commuting patterns, job locations and the importance of destinations will likely change. The model does not account for these long run changes.

- The model provides the best approximation to the short run impact of the road improvement project.

3   Impact of the new road

For each destination, these tables show the distribution of travel times from each property in the region. The tables also show the distribution of travel times from each property to the nearest rail station (RAIL).

Table 1: Travel times (minutes): pre investment

Statistic	BSP	EXE	FAL	PLY	$RAIL$
Mean	90.6	58.4	99.8	59.2	24.9
Min	22.1	20.6	27.5	18.1	8.5
Pctl(25)	67.1	32.1	81.2	40.7	19.1
Median	99.1	57.9	111.4	57.0	22.4
Pctl(75)	104.5	76.4	127.1	76.9	29.5
Max	184.9	151.9	175.5	127.9	70.4
St. Dev.	30.0	28.9	35.3	27.6	9.0

Table 2: Travel times (minutes): post investment

Statistic	BSP	EXE	FAL	PLY	$RAIL$
Mean	81.5	52.6	89.9	53.3	22.4
Min	19.9	18.5	24.8	16.3	7.6
Pctl(25)	60.4	28.8	73.1	36.7	17.2
Median	89.2	52.1	100.2	51.3	20.1
Pctl(75)	94.1	68.8	114.4	69.2	26.6
Max	166.4	136.7	158.0	115.1	63.4
St. Dev.	27.0	26.0	31.7	24.9	8.1

Table 3: Change in travel time (minutes): (new minus old)

Statistic	BSP	EXE	FAL	PLY	$RAIL$
Mean	−9.1	−5.8	−10.0	−5.9	−2.5
Min	−18.5	−15.2	−17.6	−12.8	−7.0
Pctl(25)	−10.5	−7.6	−12.7	−7.7	−3.0
Median	−9.9	−5.8	−11.1	−5.7	−2.2
Pctl(75)	−6.7	−3.2	−8.1	−4.1	−1.9
Max	−2.2	−2.1	−2.8	−1.8	−0.8
St. Dev.	3.0	2.9	3.5	2.8	0.9

4 Impact on prices

Table 4: Property prices (units = year 2017)

Statistic	$oldprice$	$newprice$	$deltaprice$
Mean	211, 453.9	196, 170.7	−15, 283.3
Min	70, 417.4	31, 764.7	−1, 451, 887.0
Pctl(25)	152, 595.0	136, 471.1	−23, 816.1
Median	189, 818.7	177, 368.4	−2, 545.6
Pctl(75)	247, 224.0	235, 481.3	7, 761.0
Max	1, 911, 362.0	721, 288.7	45, 398.0
St. Dev.	87, 223.1	86, 968.5	43, 231.8

This table shows the distribution of property prices across all properties in the region

5 Data

6 Model

Section 6.1 shows how log prices depend on building characteristics and time.

Section 6.2 shows how log prices depend on travel times to important cities and destinations in the region as well as on other local amenities and disamenities.

6.1 Model 1

Table 5: Dependence of log property values on structure and time

	Dependent variable:
	logprice
year2009	−0.066*** (0.004)
year2010	−0.003 (0.004)
year2011	−0.022*** (0.004)
year2012	−0.016*** (0.004)
year2013	−0.011** (0.004)
year2014	0.029*** (0.004)
year2015	0.068*** (0.004)
year2016	0.103*** (0.004)
year2017	0.129*** (0.005)
propertytypeF	−0.269*** (0.007)
propertytypeO	−0.026* (0.014)
propertytypeS	−0.212*** (0.002)
propertytypeT	−0.314*** (0.002)
newbuildY	0.091*** (0.003)
tenureL	−0.146*** (0.006)
bSize1	0.281*** (0.011)
bSize2	0.459*** (0.009)
bSize3	0.757*** (0.010)
bSize4	1.281*** (0.011)
bSize5	1.387*** (0.015)
bLat1	2.460*** (0.115)
Observations	100,000
R^2	0.682
Adjusted R^2	0.681
Residual Std. Error	0.256 (df = 99859)
F Statistic	1,528.639*** (df = 140; 99859)
Note:	*p<0.1; **p<0.05; ***p<0.01

6.2 Model 2

Table 6: Dependence of log property values on locational amenities

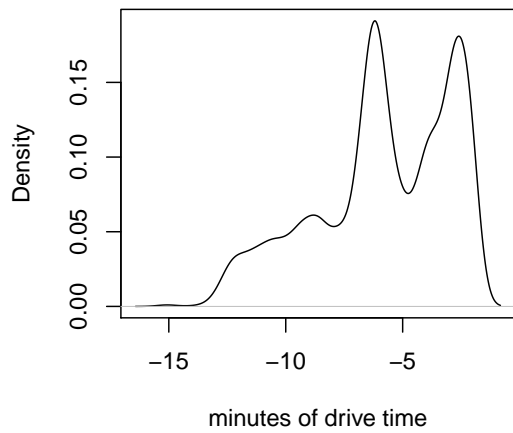|	Dependent variable:
	location_value
builtuparea_pct	-0.0004^{***} (0.0001)
busyland_pct	-0.0005^{***} (0.0002)
restrictedland_pct	
localplanrate	-11.657^{***} (0.873)
lu_domestic_shr	-0.125^{*} (0.069)
lu_gardens_shr	0.317^{***} (0.041)
lu_nondom_shr	0.805^{***} (0.101)
lu_road_shr	-0.314^{***} (0.080)
lu_rail_shr	-0.542^{***} (0.102)
lu_greenspace_shr	0.124^{***} (0.036)
lu_water_shr	0.148^{***} (0.039)
popdensityOA	-0.0001^{***} (0.00002)
imddecile2	-0.002 (0.004)
imddecile3	0.006 (0.004)
imddecile4	0.005 (0.004)
imddecile5	0.008^{**} (0.004)
imddecile6	0.014^{***} (0.004)
imddecile7	0.011^{***} (0.004)
imddecile8	0.018^{***} (0.004)
imddecile9	0.031^{***} (0.004)
imddecile10	0.040^{***} (0.005)
prob_4bandHigh	0.042 (0.056)
prob_4bandLow	0.046 (0.056)
prob_4bandMedium	0.061 (0.056)
prob_4bandNone	0.051 (0.056)
prob_4bandVery Low	0.089 (0.057)
noiseclass>=75.0	0.027 (0.056)
noiseclass55.0-59.9	-0.012^{***} (0.003)
noiseclass60.0-64.9	-0.005 (0.005)
noiseclass65.0-69.9	-0.006 (0.007)
noiseclass70.0-74.9	-0.015 (0.015)
greenbelt	
log(distance_coast)	-0.010^{***} (0.001)
log(drive_station)	0.026^{***} (0.008)
Constant	1.501^{***} (0.122)
Observations	9,751
R^2	0.828
Adjusted R^2	0.826
Residual Std. Error	0.056 (df = 9662)
F Statistic	526.885^{***} (df = 88; 9662)

Note:	*p<0.1; **p<0.05; ***p<0.01

7   Figures

Drive time reduction: Barnstaple
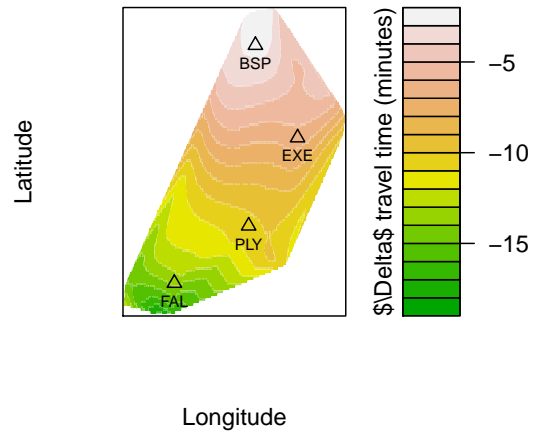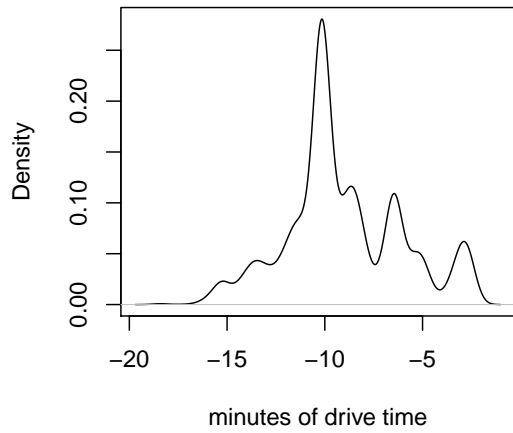
Drive time reduction: Exeter
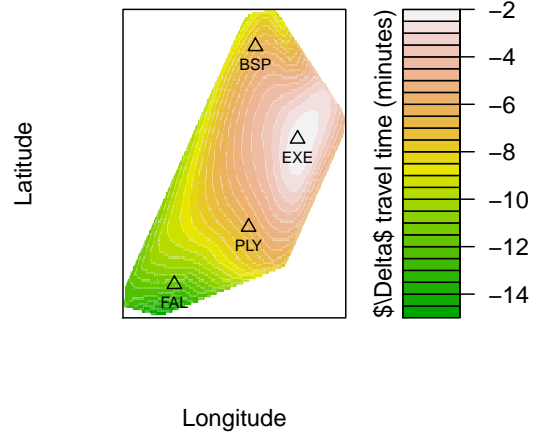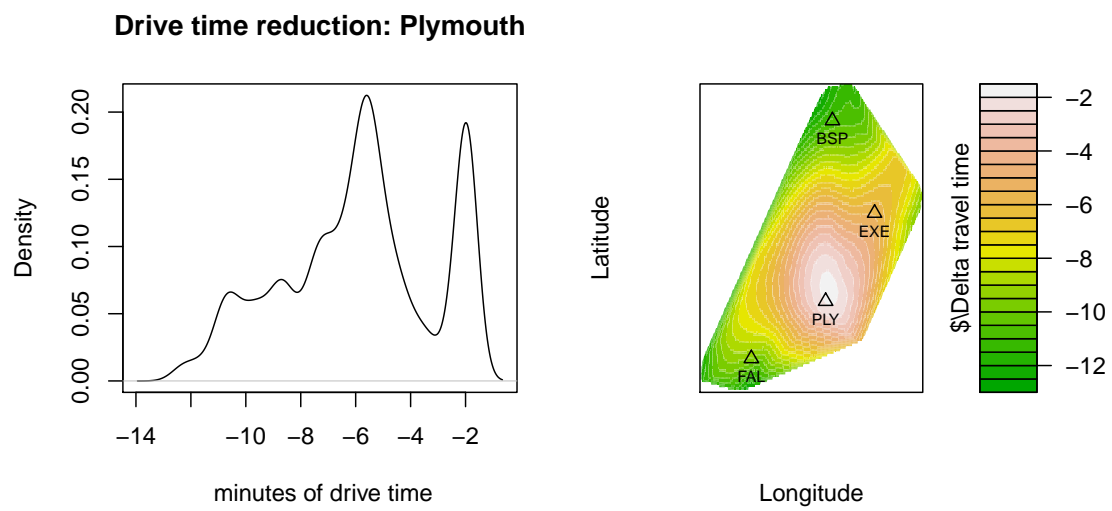
Drive time reduction: Falmouth
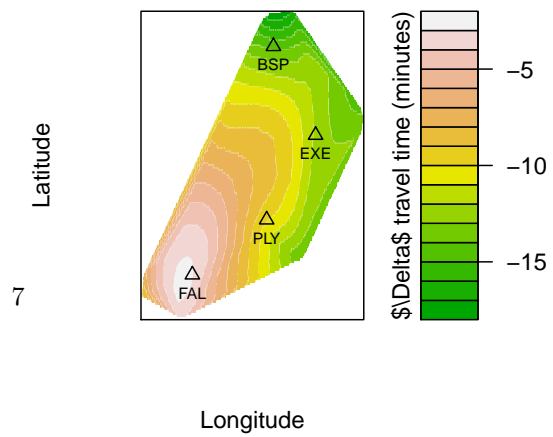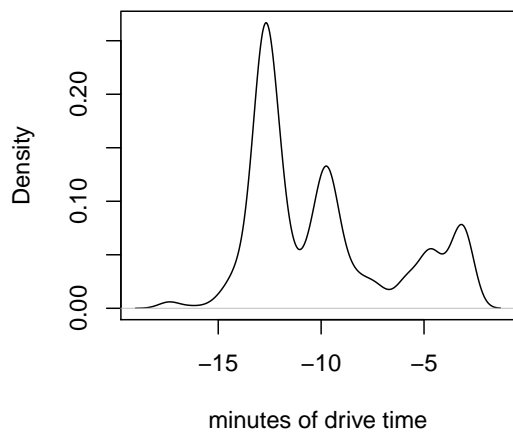
Figure 2: Driving time

Figure 3: Driving time

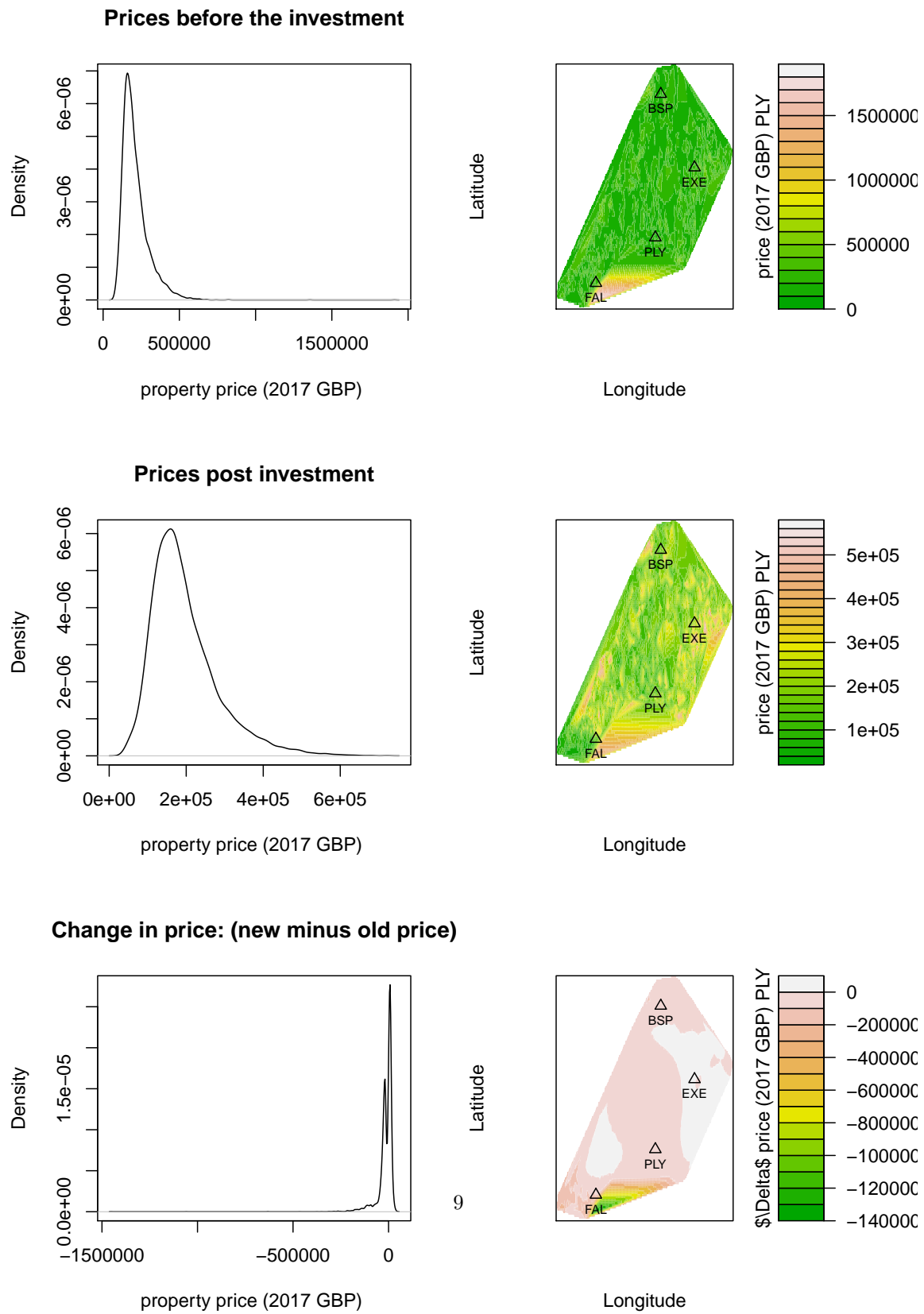**Prices before the investment**

Prices post investment

Change in price: (new minus old price)

9

Figure 4: Impact of project on prices