

Technical note

Project:	Newgale WelTAG Study	To:	Neil Carpenter
Subject:	WelTAG Biodiversity Assessment	From:	Nancy Davies
Date:	11 Jan 2017	cc:	Duncan McLaughlin

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N.B. The text within this Technical Note will be inputted into a multi-discipline WelTAG assessment prior to issue to the client and will be subject to revision/review.

1.1. Introduction

Four options for a realignment of the A487 in Newgale, Pembrokeshire have been proposed, these are Options 3, J, 7 & 11. This report provides a qualitative appraisal of the potential construction and operation impacts of each option on biodiversity features. The options can be viewed on Figure 20160152-XX-22-ATK-DR-D-2000.

1.2. Baseline

1.2.1. Statutory Designated Sites

Information on statutory designated sites biodiversity and earth heritage¹ located within 2 km of each of the Option study area (a linear search along the route with a 2 km buffer zone) was obtained from the Multi-Agency Geographical Information for the Countryside (MAGIC²) website in November 2016. In line with guidance from the Design Manual for Roads and Bridges, the search area was extended to 30 km for European designated sites with bats as a qualifying feature³. The search was also extended to include European designated sites where other pathways for impacts may occur, e.g. hydrological links via waterways.

An overview of the statutory designated sites located within the search area is provided in Table 3.2.

¹ Including: Special Areas of Conservation (SAC), Special Protection Areas (SPA), Ramsar sites, Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR) and Local Nature Reserves (LNR).

² www.magic.defra.gov.uk

³ Highways Agency (2009). *HD44/09 - Design Manual for Roads and Bridges Assessment of Implications (of Highways and/or Roads Projects) on European Sites (Including Appropriate Assessment)*.

*Site with hydrological connection to option.

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Table 3-2 Overview of biodiversity and earth heritage statutory designated sites within the Option study areas

Road route options	Statutory designated site	Distance/direction from study area
Option 3	Pembrokeshire Bat Sites and Bosherton Lakes/Safleoedd Ystlum Sir Benfro a Llynnoedd Bosherton, SAC	27 km NE
	St David's/Ty Ddewi SAC	0.8km NW
	Pembrokeshire Marine/Sir Benfro Forol SAC	0.2km W
	Ramsay and St David's peninsula Coast SPA	0.8km NW
	St David's Peninsula Coast SSSI	0.07 km NW
Option J	Pembrokeshire Bat Sites and Bosherton Lakes/Safleoedd Ystlum Sir Benfro a Llynnoedd Bosherton, SAC	25 km NE
	St David's/ Ty Ddewi SAC	0.8km NW
	Pembrokeshire Marine/Sir Benfro Forol SAC	0.8km W
	Ramsey and St David's Peninsula Coast SPA	0.6 km NW
Option 7	Pembrokeshire Bat Sites and Bosherton Lakes/Safleoedd Ystlum Sir benfro a Llynnoedd Bosherton, SAC	24 km NE
	St David's/ Ty Ddewi SAC	0.6km SW
	Pembrokeshire Marine/Sir Benfro Forol SAC	0.7km SW
	Ramsey and St David's Peninsula SPA	0.8km SW
	St David's Peninsula Coast SSSI	0.6km SW
Option 11	Pembrokeshire Bat Sites and Bosherton Lakes/Safleoedd Ystlum Sir Benfro a Llynnoedd Bosherton, SAC	20 km NE
	Ramsey and St David's Peninsula Coast SPA	0.7km SW
	St David's Peninsula Coast SSSI	0.7km SW
	St David's/Ty Ddewi SAC	0.7km SW
	Pembrokeshire Marine/Sir Benfro Forol SAC	0.8km SW

Through consultation with Pembrokeshire County Council, it is understood that the lowland marsh habitat that runs through the study area may be designated as a SSSI in the future, although it is understood this is unlikely to happen prior to the completion of this Scheme.

Non-statutory Designated Sites

West Wales Biodiversity Information Centre (WWBIC) was contacted to obtain records of non-statutory designated sites⁴ within 1 km of each option in November 2016. There were no records of any non-statutory designated sites within the data provided by WWBIC.

1.2.2. Habitats

Ordnance Survey map data and aerial imagery of the study areas was investigated in order to identify the broad habitat types present within the footprint of each option and to enable an initial assessment of potential impacts to habitats. No site visit has been undertaken by an ecologist to inform this work.

⁴ e.g. Locally designated Sites of Importance for Nature Conservation (SINC).

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The study area is located in coastal West Wales near Newgale, Haverfordwest, Pembrokeshire. All options are situated around a valley containing the Brandy Brook. An area of floodplain marsh is present at the valley bottom and is likely to contain a mosaic of wetland habitats. This is surrounded by more elevated land consisting of undulating agricultural habitats typically comprised of small, hedgerow bordered pasture fields (some marshy), patches of broadleaved and mixed woodlands. A summary of the habitat features potentially affected by each option is provided in Table 3.3.

Table Error! No text of specified style in document.3-3 Habitat feature summary (all values are approximate)

Option	Waterbodies within 500 m	Watercourse crossings	Lengths of Hedgerow affected (m)	Woodlands affected
Option 3	1	1	81	0
Option J	4	1	318	10
Option 7	5	2	1100	8
Option 11	0	2	6200	4

1.2.3. Species

WWBIC (West Wales Biodiversity Information Centre) was contacted to obtain records of notable species⁵ within the study area, incorporating all options and a further 1 km buffer around the area (extended to 5 km for bat records) in November 2016. Partly as a result of the degree of geographical overlap between the different options, the same protected species have been recorded within the search area. **Table 3-4 below** states the number of species records in each Taxon group split into total and protected species within that total:

Table 3-4 Number of species records and protected species records within study area

Taxon group	Total number of records of notable species (incl. protected species)	Number of records of legally protected species within total
Birds	1832	177
Amphibians	4	4
Insects	118	0
Bats	28 (incl. Greater & Lesser Horseshoe bats)	28 (incl. Greater & Lesser Horseshoe bats)
Terrestrial mammals (not incl. bats)	63	19
Reptiles	9	9

Greater and Lesser horseshoe bats are among the bats listed in the bat species records found in the vicinity of all of the Schemes. This could indicate connectivity with the Pembrokeshire Bat and Bosherton Lakes SACs. Even though females may fly from Bosherton to St Davids to maternity

⁵ Notable species are taken as principal species for the conservation of biodiversity listed under Section 42 of the Natural Environment and Rural Communities Act 2006; any species listed under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended); any species listed under Annex II or Annex IV of the Habitats Directive (1992); any species listed in an IUCN Red Data Book.

As all wild birds are protected under the Wildlife and Countryside Act 1981 (as amended), only specially protected bird species listed on Schedule 1 of the Act have been included in the protected species search. Other notable bird species are covered in Section 3.4.5.

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areas, it is most likely that there is potential to affect the foraging and commuting behaviours of the bats rather than the roosting behaviour in the SACs indicated.

Other protected species for which there are no existing WWBIC records but which could be present in the habitats identified in the study area and could potentially pose a constraint to development if present include:

- Dormouse;
- Water vole;
- Common lizard, and;
- Great crested newt (although very unlikely as no previous records in Pembrokeshire).

1.3. Valuation

A desk-based study has been undertaken to collect information on the biodiversity and earth heritage features which could potentially be affected by each option.

With reference to the potential impacts of road schemes described in the DMRB, Volume 11, Section 1.2.3, 3, Part 4, Chapter 5, and in accordance with the methods described in TAG UNIT A3 Environmental Impact Appraisal⁶, a qualitative appraisal has been undertaken of the potential impacts of each option on the biodiversity and earth heritage features identified during the desk study. For the purposes of the appraisal, the identified biodiversity and earth heritage features have been grouped into the four receptors described and evaluated⁷ in Table 3-12. The valuation is based on the criteria in Table 3.5 below.

Table 3.5 Guidance on Describing the Biodiversity and Earth Heritage Value of Features		
Value	Criteria	Examples
Very High	High importance and rarity, international scale and limited potential for substitution	Internationally designated sites
High	High importance and rarity, national scale, or regional scale with limited potential for substitution	Nationally designated sites Regionally important sites with limited potential for substitution
Medium	High or medium importance and rarity, local or regional scale, and limited potential for substitution	Regionally important sites with potential for substitution Locally designated sites
Low	Low or medium importance and rarity, local scale	Undesignated sites of some local biodiversity and earth heritage interest
Negligible	Very low importance and rarity, local scale	Other sites with little or no local biodiversity and earth heritage interest

Table 3.6 Relevant ecological receptors

Receptor	Description	Value
European designated sites	Pembrokeshire Bat Sites and Bosherton Lakes/Safleoedd Ystlum Sir Benfro a Llynnoedd Bosherton, SAC . St David's/Ty Ddewi SAC .	Very high

⁶ TAG UNIT A3 Environmental Impact Appraisal, Dec 2015, Department for Transport, Transport Analysis Guidance (TAG)

⁷ Values are based on Table 1 of Web TAG Unit 3.3.10 – The Biodiversity Sub-Objective (<http://www.dft.gov.uk/webtag/documents/expert/pdf/unit3.3.10.pdf>).

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Receptor	Description	Value
	Pembrokeshire Marine/Sir Benfro Forol SAC and Ramsay and St David's Peninsula Coast SPA together comprise a number of internationally important coastal habitat features including maritime vegetation communities within reefs, sandbanks, mud flats and Atlantic salt meadows. These habitats ultimately help to support internationally important bird, seal and lamprey populations.	
SSSIs within 2 km	St David's Peninsula Coast SSSI (part of the St David's Peninsula Coast SPA) comprises of important geological and biological feature, namely lichens, invertebrates, Choughs and Peregrines and is nationally important for grey seals.	High
Floodplain marsh	Through consultation with Pembrokeshire County Council, it is understood that the lowland marsh habitat that runs through the study area may be designated as a SSSI in the future. Therefore for this assessment, it is assumed that the assemblage of habitats are of SSSI quality and they have been valued as of High importance.	High
Farmland habitats and notable species	Farmland habitats include grasslands, hedgerows, woodland, rivers and streams. These habitats have the potential to support a range of protected and notable species, which may include (but are not necessarily limited to): bats; badger; birds such as red kite; slow worm; and a range of moths and butterflies, including marsh fritillary.	Low

1.3.1. Impact

For each option, the overall assessment has been qualitatively assessed for each receptor using the following seven-point scale to determine their importance:

- Large beneficial;
- Moderate beneficial;
- Slight beneficial;
- Neutral;
- Slight adverse;
- Moderate adverse
- Large adverse; and
- Very large adverse

The overall assessment score combines the appraisal of biodiversity and earth heritage value of the features, with the appraisal of the magnitude of the impacts, to determine the consequence of those impacts, it is a function of the magnitude of the impact (assessment of the impact of the scheme on the significance of the features identified)⁸ and the biodiversity and earth heritage value of the receptor. An overall impact has been determined for each option, based on the most significant adverse impact in each case.

Potential hedgerow loss length has been approximately calculated by marking the locations of hedgerows on general arrangement plans of each option and measuring the lengths of hedgerow that are due to be impacted by the new road option footprint.

The qualitative impact appraisals are provided for each option in Table 3.8 to 3.11 below. The overall assessment score has been calculated using the criteria in Table 3.7 below

⁸ TAG UNIT A3 Environmental Impact Appraisal, Dec 2015, Department for Transport, Transport Analysis Guidance (TAG)

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Table 3.7 Estimating the Overall Assessment Score					
Magnitude of Impact	Biodiversity and earth heritage value				
	Very High	High	Medium	Low	Negligible
Major negative	Very Large Adverse	Very Large Adverse	Moderate Adverse	Slight adverse	Neutral
Intermediate negative	Large Adverse	Large Adverse	Moderate Adverse	Slight adverse	Neutral
Minor negative	Slight adverse	Slight adverse	Slight adverse	Slight adverse	Neutral
Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Positive	Large beneficial	Large beneficial	Moderate beneficial	Slight beneficial	Neutral

Table 3.8 Option 3

Receptor (and value)	Impact	Magnitude	Overall Appraisal (value x magnitude)
European designated sites (Very high)	Assuming standard pollution prevention measures no impacts are anticipated on; <ul style="list-style-type: none"> Pembrokeshire Marine SAC St David's/Ty Ddewi SAC Ramsay and St David's Peninsula Coast SPA A compartment of Pembrokeshire Bat Sites and Bosherton Lakes SAC is located 27 km NE from the Scheme. Greater and lesser horseshoe bats are the reason for the designation. Records of these species have been found within the vicinity of this Scheme option. It is unlikely that at this distance away from the SACs, the Scheme would have an impact on the roosting bats. However, if hedgerows are lost, which are connective foraging points for bats, the foraging and commuting behaviour of the bats could be impacted. 	Minor negative	Slight adverse
SSSIs within 2 km (High)	Potential impacts on St David's Peninsula coast SSSI through any noise/artificial light disturbance made around the bird nesting seasons for Choughs and Peregrines.	Minor negative	Slight adverse
Floodplain marsh (High)	Minimal loss of marsh wetland habitat. Route close to Brandy Brook and tributaries carries risk of pollution into Brandy Brook during construction and operation affecting temporary disturbance of sediments during construction and also effect hydrological features such as flow of	Minor negative	Slight adverse

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Receptor (and value)	Impact	Magnitude	Overall Appraisal (value x magnitude)
	water across the habitat with the ability to alter the habitats. This has the potential to cause indirect impacts on Pembrokeshire Marine/Sir Benfro Forol SAC . Standard forms of mitigation should be in place to prevent these risks.		
Farmland habitats and notable species (Low)	<ul style="list-style-type: none"> • Loss of amenity campsite and some arable farmland. • Indirect loss/degradation of adjacent habitats as a result of noise and light generated during construction and operation. • Potential loss of 81 meters of hedgerow. • 1 watercourse crossing over Brandy Brook. • Killing/injury of protected and notable species during construction and operation 	Minor negative	Slight adverse
Overall: Slight adverse			

Table 3-9 Option J

Receptor (and value)	Impact	Magnitude	Overall Appraisal (value x magnitude)
European designated sites with hydrological connections (Very high)	<p>Assuming standard pollution prevention measures no impacts are anticipated on:</p> <ul style="list-style-type: none"> • Pembrokeshire Marine SAC • St David's/Ty Ddewi SAC • Ramsay and St David's Peninsula Coast SPA • Pembrokeshire Marine SAC is located immediately off shore, there is a potential risk of impact on this SAC from pollution travelling down the Brandy Brook river course. • A compartment of Pembrokeshire Bat Sites and Bosherton Lakes SAC is located 25 km NE from the Scheme. Greater and lesser horseshoe bats are the reason for the designation. Records of these species have been found within the vicinity of this Scheme option. It is unlikely that at this distance away from the SACs, the Scheme would have an impact on the roosting bats. However, if hedgerows are lost, which are connective foraging points for bats, the foraging and commuting behaviour of the bats could be impacted. 	Minor negative	Slight adverse

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Receptor (and value)	Impact	Magnitude	Overall Appraisal (value x magnitude)
SSSIs within 2 km (High)	Potential impacts on St David's Peninsula coast SSSI through any noise/artificial light disturbance made around the bird nesting seasons for Choughs and Peregrines.	Minor negative	Slight adverse
Floodplain marsh (High)	Loss of marsh wetland habitat and habitat fragmentation. Direct route over Brandy Brook and tributaries carries risk of pollution into Brandy Brook during construction and operation affecting temporary disturbance of sediments during construction and also effect hydrological features such as flow of water across the habitat with the ability to alter the habitats. This has the potential to cause indirect impacts on Pembrokeshire Marine/Sir Benfro Forol SAC . Standard forms of mitigation should be in place to prevent these risks.	Major negative	Very large adverse
Farmland habitats and notable species (Low)	<ul style="list-style-type: none"> • Direct loss of arable farmland. Predominantly grassland pasture and hedgerows. • Indirect loss/degradation of adjacent habitats as a result of noise and light generated during construction and operation • Loss/fragmentation of broadleaved woodland pockets (10 in total either on direct route course or within 1 km from site area). • Potential for loss of 318 meters of hedgerow. • Potential impact on 6 ponds within 1km from site area and 1 watercourse crossing over Brandy Brook. • Killing/injury of protected and notable species during construction and operation 	Minor negative	Slight adverse
Overall: Very large adverse			

Table 3-10 Option 7

Receptor (and value)	Impact	Magnitude	Overall Appraisal (value x magnitude)
European designated sites with hydrological connections (Very high)	<p>Assuming standard pollution prevention measures no impacts are anticipated on;</p> <ul style="list-style-type: none"> • Pembrokeshire Marine SAC • St David's/Ty Ddewi SAC • Ramsay and St David's Peninsula Coast SPA • A compartment of Pembrokeshire Bat Sites and Bosherton Lakes SAC is located 24 km NE from the Scheme. Greater and lesser horseshoe bats are 	Minor negative	Slight adverse

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Receptor (and value)	Impact	Magnitude	Overall Appraisal (value x magnitude)
	the reason for the designation. Records of these species have been found within the vicinity of this Scheme option. It is unlikely that at this distance away from the SACs, the Scheme would have an impact on the roosting bats. However, if hedgerows are lost, which are connective foraging points for bats, the foraging and commuting behaviour of the bats could be impacted.		
SSSIs within 2 km (High)	Potential impacts on St David's Peninsula Coast SSSI through any noise/artificial light disturbance made around the bird nesting seasons for Choughs and Peregrines.	Minor negative	Slight adverse
Floodplain marsh (High)	Loss of marsh wetland habitat and habitat fragmentation. Direct route over Brandy Brook and tributaries carries risk of pollution into Brandy Brook during construction and operation affecting temporary disturbance of sediments during construction and also effect hydrological features such as flow of water across the habitat with the ability to alter the habitats. This has the potential to cause indirect impacts on Pembrokeshire Marine/Sir Benfro Forol SAC . Standard forms of mitigation should be in place to prevent these risks.	Major negative	Very large adverse
Farmland habitats and notable species (Low)	<ul style="list-style-type: none"> Direct loss of arable farmland. Predominantly grassland pasture and hedgerows. Indirect loss/degradation of adjacent habitats as a result of noise and light generated during construction and operation Loss/fragmentation of broadleaved woodland pockets (8 in total either on direct route course or within 1 km from site area). Potential impact on 6 ponds within 1km from site area and 2 watercourse crossings over Brandy Brook. Potential for loss of 1100 meters of hedgerow. Killing/injury of protected and notable species during construction and operation 	Minor negative	Slight adverse
Overall: Very large adverse			

Table 3-11 Option 11- Based on proposed widening of the road

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Receptor (and value)	Impact	Magnitude	Overall Appraisal (value x magnitude)
European designated sites with hydrological connections (Very high)	Assuming standard pollution prevention measures no impacts are anticipated on: <ul style="list-style-type: none"> Pembrokeshire Marine SAC St David's/Ty Ddewi SAC Ramsay and St David's Peninsula Coast SPA A compartment of Pembrokeshire Bat Sites and Bosherton Lakes SAC is located 22 km NE from the Scheme. Greater and lesser horseshoe bats are the reason for the designation. Records of these species have been found within the vicinity of this Scheme option. It is unlikely that at this distance away from the SACs, the Scheme would have an impact on the roosting bats. However, if hedgerows are lost, which are connective foraging points for bats, the foraging and commuting behaviour of the bats could be impacted. 	Minor negative	Slight adverse
SSSIs within 2 km (High)	Potential impacts on St David's Peninsula coast SSSI through any noise/artificial light disturbance made around the bird nesting seasons for Choughs and Peregrines.	Minor negative	Slight adverse
Floodplain marsh (High)	Widening of route over Brandy Brook and tributaries could cause loss of marsh wetland habitat and habitat fragmentation. Considering that the floodplain is narrower at this location, this loss is less than both Option J & 7. Direct route over Brandy Brook and tributaries carries risk of pollution into Brandy Brook during construction and operation affecting temporary disturbance of sediments during construction and also effect hydrological features such as flow of water across the habitat with the ability to alter the habitats. This has the potential to cause indirect impacts on Pembrokeshire Marine/Sir Benfro Forol SAC . Standard forms of mitigation should be in place to prevent these risks.	Intermediate negative	Large adverse

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Receptor (and value)	Impact	Magnitude	Overall Appraisal (value x magnitude)
Farmland habitats and notable species (Low)	<ul style="list-style-type: none"> Direct loss of arable farmland. Predominantly grassland pasture and hedgerows. Indirect loss/degradation of adjacent habitats as a result of noise and light generated during construction and operation. Loss/fragmentation of broadleaved woodland pockets (11 in total either on direct route course or within 1 km from site area). Potential loss of 6200 meters of hedgerow (unless translocated) Potential impact on 6 ponds within 1km from site area and 2 watercourse crossings over Brandy Brook. Killing/injury of protected and notable species during construction and operation 	Intermediate negative	Moderate adverse
Overall: Large adverse			

1.3.1. Conclusions

The table 3-12 below displays the overall scores of each option and provides an appraisal summary of each in consideration of Scheme preference.

Table 3-12 Scheme Options Appraisal summary

Option	Overall score	Appraisal Summary
Option 3	Slight adverse	In light of this biodiversity assessment, from an ecological perspective, this option is considered overall the most preferred option as it has an overall score of slight adverse . However, this option would still result in the loss of high importance lowland marsh habitat. Out of the four options, this option is likely to result in fewer impacts to hedgerows (lowest length of hedgerow due to be lost (81 m)) and it is unlikely that any woodlands are to be affected. It is unlikely but still possible that potential indirect impacts on Pembrokeshire Marine SAC could be caused.
Option J	Very large adverse	With an overall assessment score of very large adverse assigned to this option, in light of this biodiversity assessment and from an ecological perspective, this option is considered the second least favourable to Option 7. This is due to the route option including 1 river crossing structure resulting in a risk of potential indirect impacts on Pembrokeshire Marine SAC, which is located immediately off shore. There is a potential risk of pollution travelling down the Brandy Brook river course, henceforth a risk on the SAC. However, this risk will be greatly

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		reduced with standard forms of mitigation. The scale of this option will result in a significant loss of priority habitats (lowland marsh habitat) and associated biodiversity. A large length of hedgerow (318 m) is due to be lost as a result, this is however considerably less than Option 7 and so proves less of a threat than both Option 7 & 11. Woodland areas are due to be affected also. It is unlikely this loss of habitat can be fully compensated within the Scheme.
Option 7	Very large adverse	With an overall assessment score of very large adverse assigned to this option, in light of this biodiversity assessment and from an ecological perspective, this option is considered the very least favourable. This option would result in 2 river crossings resulting in a risk of potential indirect impacts on Pembrokeshire Marine SAC, which is located immediately off shore. There is a potential risk of pollution travelling down the Brandy Brook river course, hence forth a risk on the SAC. However, this risk will be greatly reduced with standard forms of mitigation. The scale of this option will result in a significant loss of priority habitats (lowland marsh habitat) and associated biodiversity. The second greatest linear length of hedgerow (1100 m) has the potential to be lost along with 8 woodland areas that are due to be affected also as well as the 2 river crossings being required. It is very unlikely this loss of habitat can be compensated within the Scheme.
Option 11	Large adverse	In light of this biodiversity assessment, from an ecological perspective, this option is considered third least-preferable after Options 7 & J as it has an overall assessment score of Large adverse . Even though widening the pre-existing road will result in minimal impacts on the nearby lowland marsh habitat, it has the greatest length (6200m) of linear hedgerows affected. This is the highest loss of hedgerows of all of the options, unless the hedgerows are due to be translocated it is highly unlikely that this loss of habitat can be compensated within this Scheme.