Joint Research Centre

Institute for Prospective Technological Studies

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The European Commission's in-house science service

Serving society
Stimulating innovation
Supporting legislation

1st Ad Hoc Working Group Meeting for the revision of the Green Public Procurement criteria

12th March 2014

GPP criteria process description

•IE – Petten, The Netherlands
• *Institute for Energy*

•IRMM – Geel, Belgium
• *Institute for Reference Materials and Measurements*

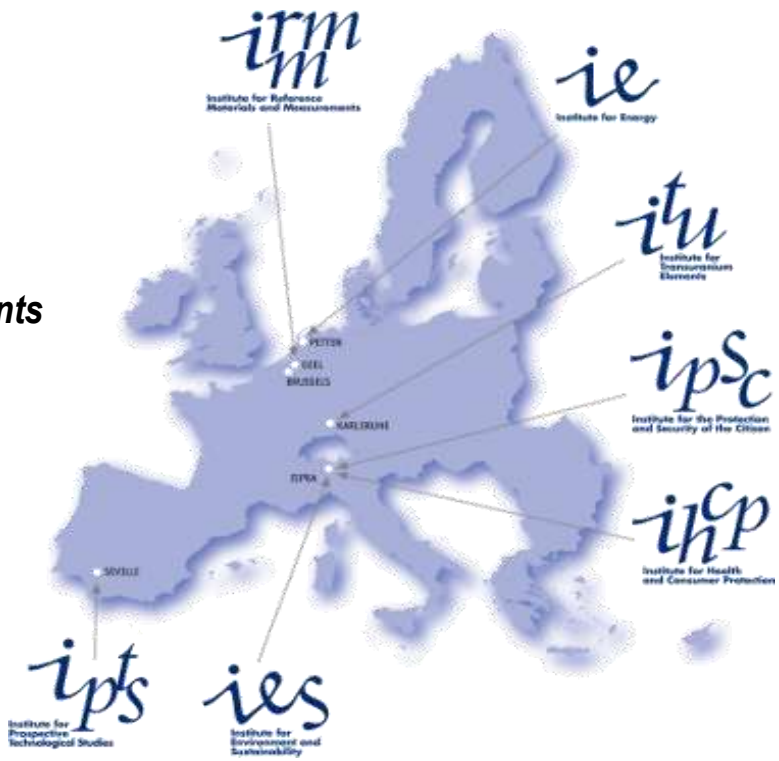
•ITU – Karlsruhe, Germany
Institute for Transuranium Elements

IES/ IHCP/ IPSC – Ispra, Italy
Institute for Environment and Sustainability

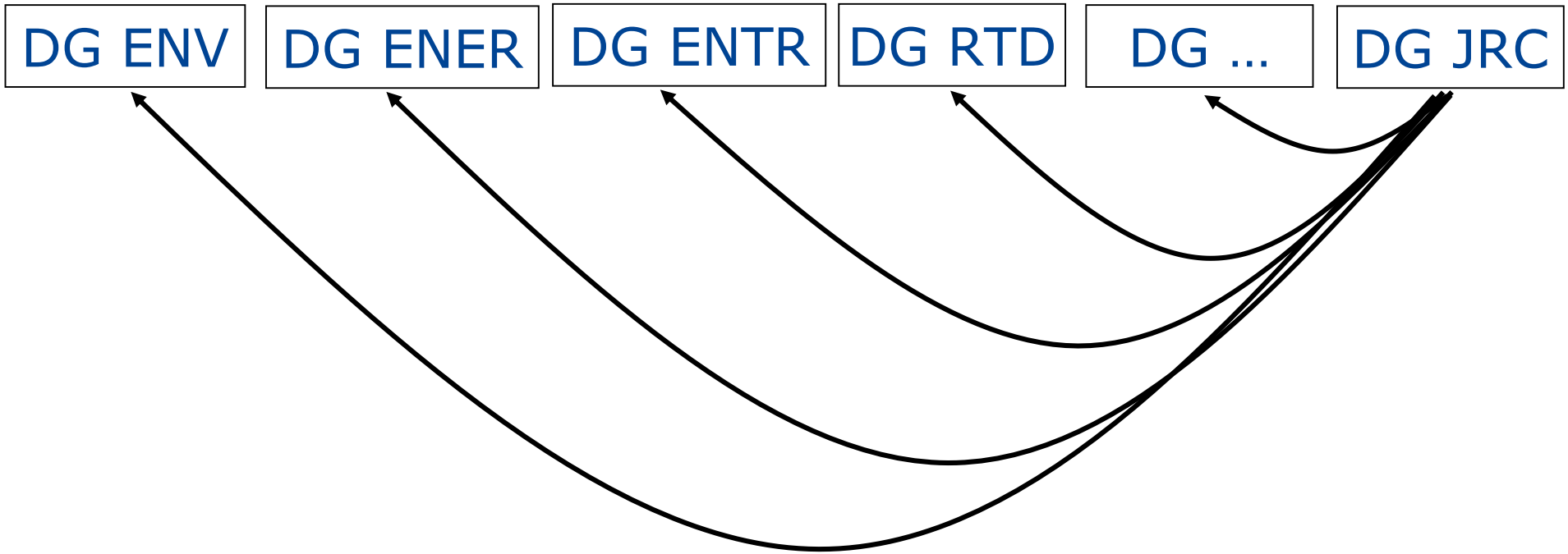
· *Institute for Health and Consumer Protection*

Institute for the Protection and Security of the Citizen

•IPTS – Sevilla, Spain
• *Institute for Prospective Technological Studies*



Joint Research Centre in the context of the European Commission:



Provide support to EU policy making process by developing **science based responses to policy challenges** that have both a socio-economic and a technological dimension.

Activities in support of Product Policy

IPTS supports the development and implementation of environmental product policies, amongst them the EU Ecolabel Regulation, the **Green Public Procurement** Communication, the Energy Related Products Directive and the Energy Labelling Directive.

This includes the techno-economic research as well as the operational management particularly of the stakeholder consultation.

GPP criteria process development

Product Group Identification (GPP AG)

Preparatory work

Stakeholder list

Preliminary Report

1. Scope and definition
2. Market analysis
3. Technical and environmental analysis
4. *Improvement potential - LCC*

Technical report (draft criteria areas and guidance on procurement) **1**

Today

Product Group Identification (GPP AG)

Preparatory work

Preliminary Report

1st AHWG

Translate criteria areas into criteria

2nd AHWG

Technical report (draft criteria areas and guidance on procurement) 1

Technical report (draft criteria and guidance on procurement) 2

Final Draft Criteria

Today's 1st AHWG

Overview:

- Preliminary background to the criteria development
- Discussion and exchange of views on draft criteria areas

Thank you

Road construction

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Scope and **definition** proposal

Project overview

2010: EU Road criteria published

2011: Revision process started following some criticism

2012: Decision to “freeze” the current development process and discuss in depth how GPP road guidance could be provided best

End of 2012: **JRC-IPTS** started the **revision of the GPP criteria**

Website

http://susproc.jrc.ec.europa.eu/road/

JRC-IPTS-ROADS@ec.europa.eu

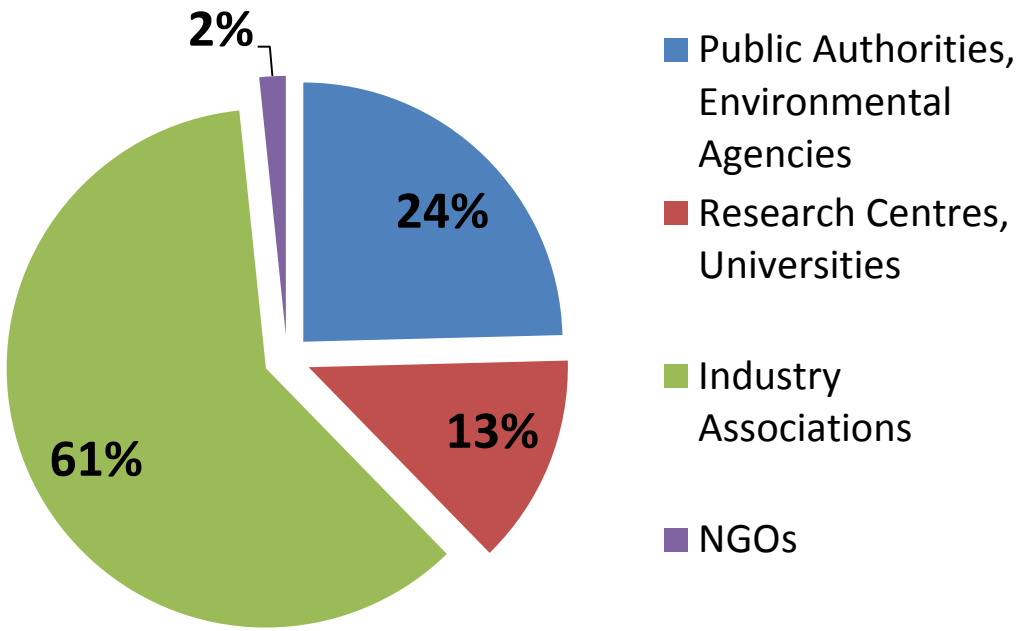
Stakeholders

EU GPP Advisory Group

Members of the AG are the MS + five stakeholders: Industry (BusinessEurope, UEAPME), NGOs (EEB, BEUC), local/regional government (Iclei)

+

61 Registered stakeholders



Scope and definition

Definition of roads

A **road** can be defined as *"Line of communication (travelled way) open to public traffic, primarily for the use of road motor vehicles, using a stabilized base other than rails or air strips"* (Eurostat, 2009, similar to OECD, 2013)

Classification of roads

Market analysis

Eurostat	**IRF**
Motorway / freeway	*Motorways*
Express road	*Highways, main or national roads*
Road outside a built-up area	*Secondary or regional roads*
	Other roads - Rural
Road inside a built-up area: urban road	*Other roads - Urban*

Definition of road construction and maintenance

Road construction

the preparation and building of a road using materials, including aggregate, bituminous and hydraulic binders and additives that are used for the sub-base, road-base and surfacing layers of the road

(previous GPP criteria for road construction and traffic signs, EC 2010 + stakeholders feedback)

Road maintenance (AAPA, 2010)

*Routine maintenance is concerned with **minor activities** required to slow down or prevent deterioration of a road pavement. It tends to be **preventive** as well as **corrective** and includes such activities as:*

- *crack-sealing*
- *pothole repair*
- *minor correction of surface texture deficiencies*
- *minor shape correction*

*Periodic maintenance primarily involves **preservation** of the asset using **thin surfacings** to restore texture or ride quality, protect the surface against entry of moisture, or prevent deterioration through ravelling and weathering*

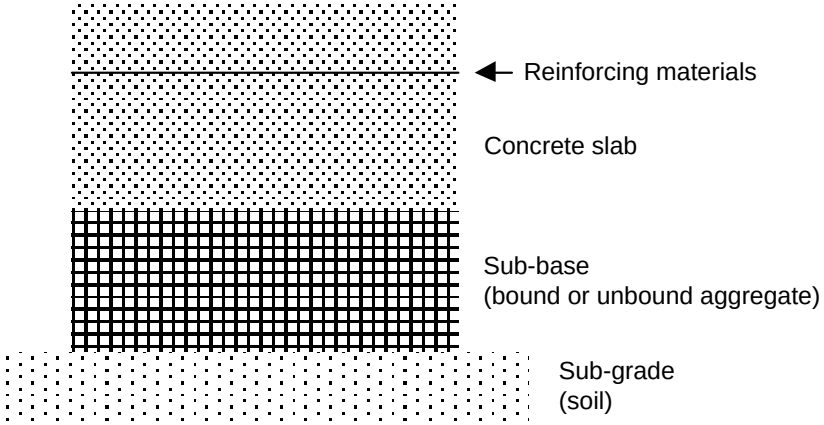
*Rehabilitation includes major work carried out to restore **structural service levels**. As such, the treatments are corrective in nature and include:*

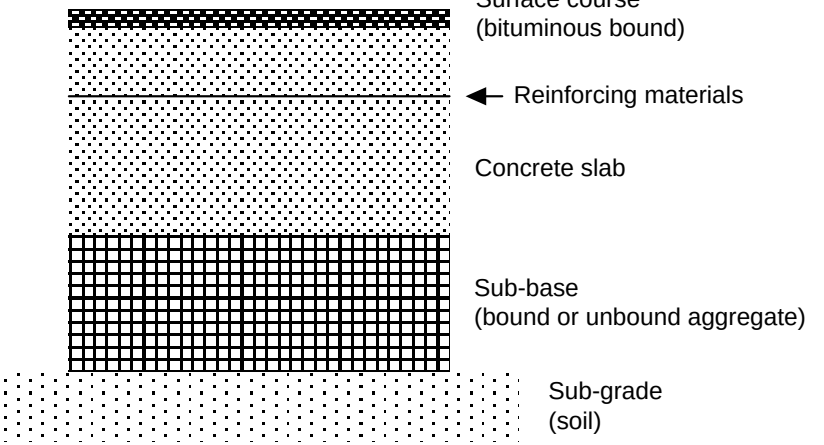
- *non-structural overlays*
- *structural asphalt overlays*
- *reconstruction or recycling of pavement materials, etc.*

Categorization of roads

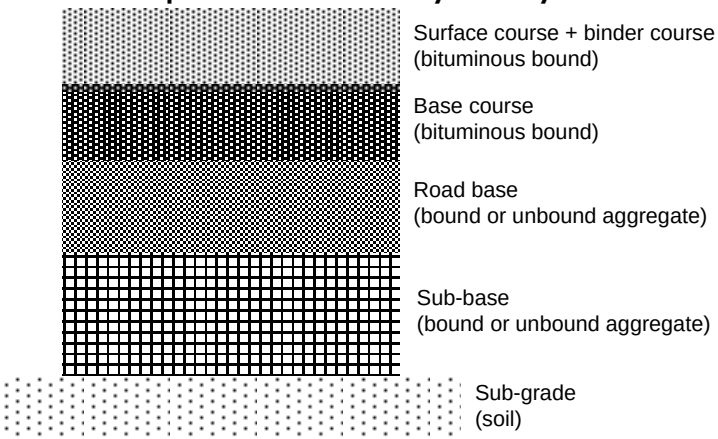
1. Pavement condition

Rigid pavements layer system

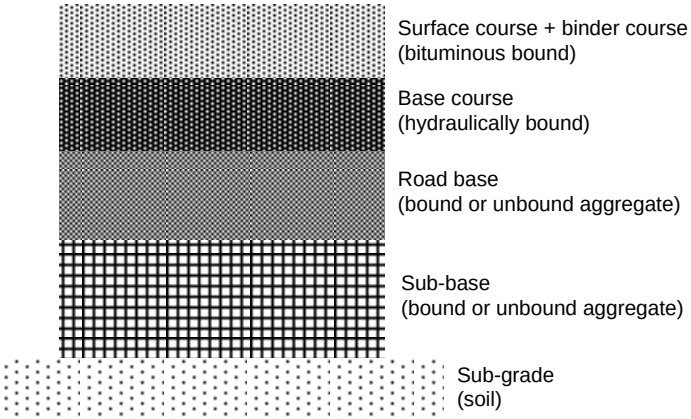




Flexible pavement layer system



Composite pavement layer system



Categorization of roads

2. Type of construction

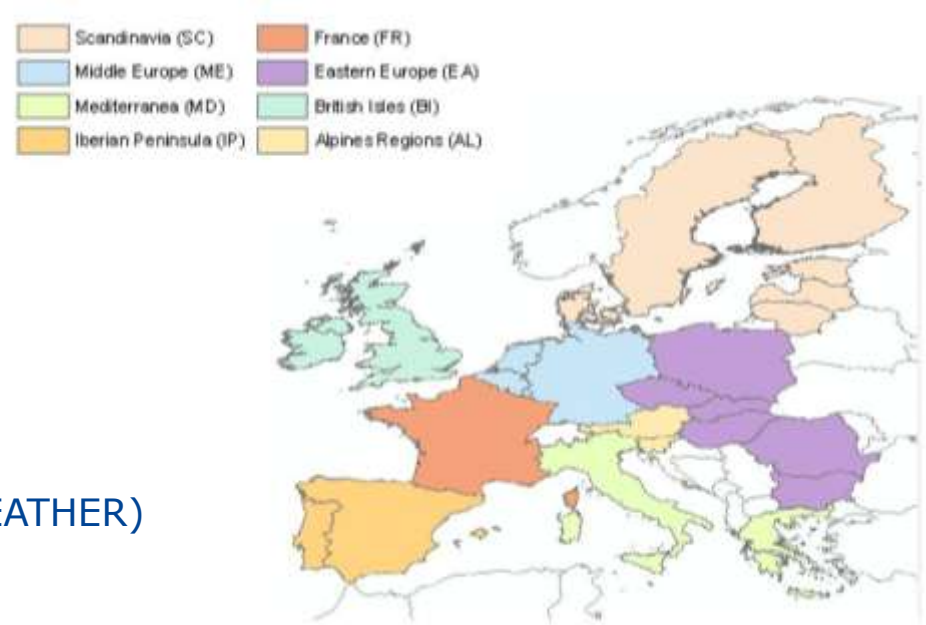
New construction

Maintenance and rehabilitation

Reconstruction

(FHWA, 2006)

3. Climatic zones



(WEATHER)

4. Traffic loading conditions

Traffic density, expressed as Annual Average Daily Traffic per lane

Traffic composition, specially the share of heavy goods vehicles

Speed limit

(Dutch GPP criteria – CEDR – MIRAVEC - ARTEMIS)

5. Road gradients

Flat

Hilly

Mountainous

(ARTEMIS)

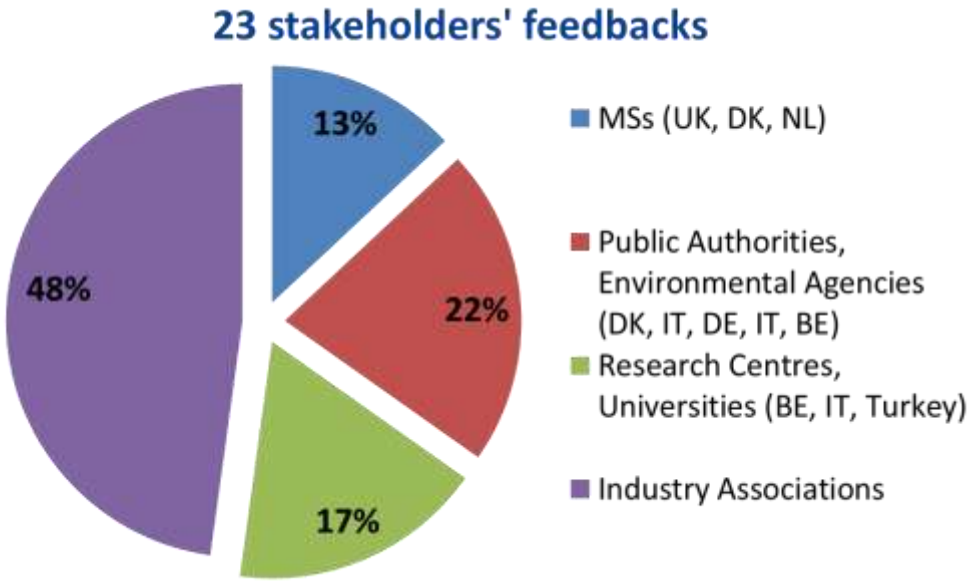
Scope proposal

Initial scope proposal

Phases included:

- the raw materials phase
- the production phase
- the road construction phase
- the use phase
- the maintenance and operation phase
- the end-of-life phase

Stakeholders consultation – Questionnaire on product scope (26.03.2013)



Agreement on approach appropriateness (80% feedbacks)

Stakeholders have suggested to include/better specify:

- **Design routes**, **speed** and **flow**, **alignment**, **dimension**
- Raw materials **transportation**
- **Recycling** phase
- Ground works and **earthworks**
- **Congestion**
- **Drainage** and **water run off systems** (pollution control and climatic resilience)
- **Noise** reducing surfaces and noise barriers
- Fencing and vehicle restraints systems

The suggestions have been included in the preliminary report

Phases considered:

- **Materials production including raw materials extraction** including transportation and recycled/secondary materials and by-products
- **Construction** including earthworks, stabilisation, equipment, drainage system, congestion
- **Use** (daily traffic during the service life ⇨ pavement is only responsible for a fuel consumption fraction)
- **Maintenance** (and operation) (repair, rehabilitation, de-icing, salting/gritting, congestion)
- **EoL**

Noise is **included**

Exclusion from the scope

- **Traffic signs,** because they are of minor importance (from literature review - Stripple, 2001; SUSCON, 2006; Loijos et al., 2013)

  ⇨ approximate **influence of the traffic signs below 1% of materials production, construction and maintenance**

  ⇨ **If the use phase is taken into account**, the traffic signs only contribute to **less than approx. 0,1% of the total potential environmental impacts during the full life cycle of a road**

  not taken into consideration in the Dutch GPP criteria 2010 and in the Italian GPP criteria under development

- **Foundations** or **lighting of traffic signs:** small amounts of energy compared to the energy consumption through the full life cycle (Stripple, 2001; Mroueh et al., 2001)

Exclusion from the scope

- **Road markings** (included in the EU GPP criteria for paints and varnishes)
- **Street lighting and traffic signals** (covered by EU GPP criteria for street lighting and traffic signals)
- **Information systems** (small amounts of energy compared to the energy consumption through the full life cycle of a road)
- **Other types of road furniture** (pedestrian walkways, bollards, overhead gantries and central reservations, as in the current criteria 2010)

LCA literature review ⇨ these elements do not reach the cut-off values in the examined LCA studies: it is proposed to **keep the exclusions suggested** at the beginning of the project

Questions

- Do you have **additional remarks** to the scope proposal discussed with the GPP AG? Opinions?

Thank you

European Commission

Road construction

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Preliminary findings from the techno-economic and environmental analysis

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Legislative framework

Legislation

- Mandatory legislation (CPR– SEA – EIA – WFD)
- Voluntary legislation

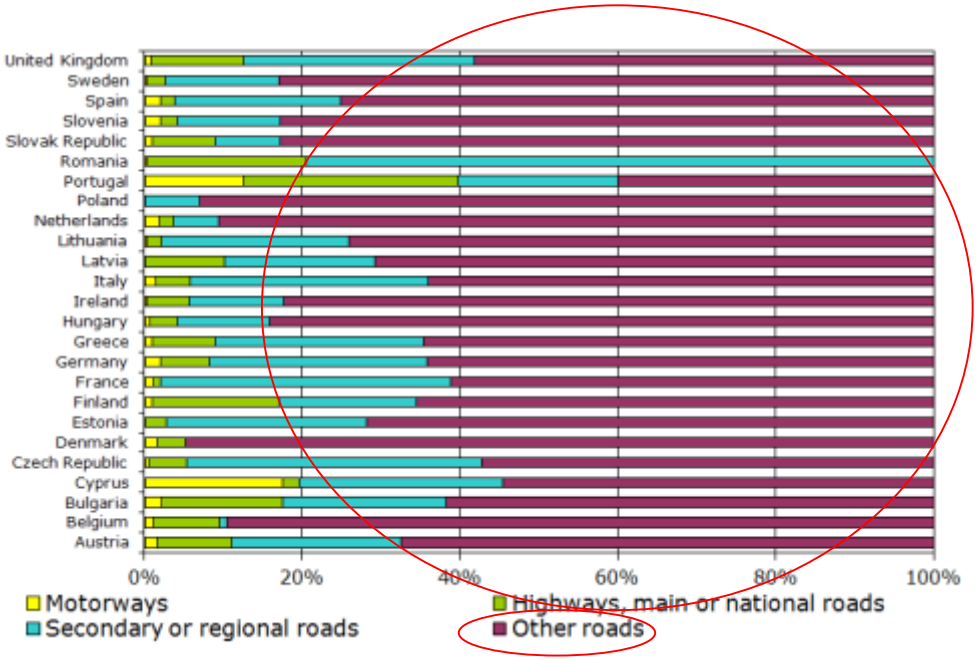
GPP criteria

- National **GPP criteria** in **EU Countries**
  - the **Dutch** GPP criteria on roads
  - The **French** voluntary commitment between USIRF and the Ministry of Ecology
  - The draft **Italian** GPP criteria on road construction and maintenance
  - *CEEQUAL rating system*
- **GPP criteria** in **non EU Countries**
  - **Australian** and **US** rating systems

Standards

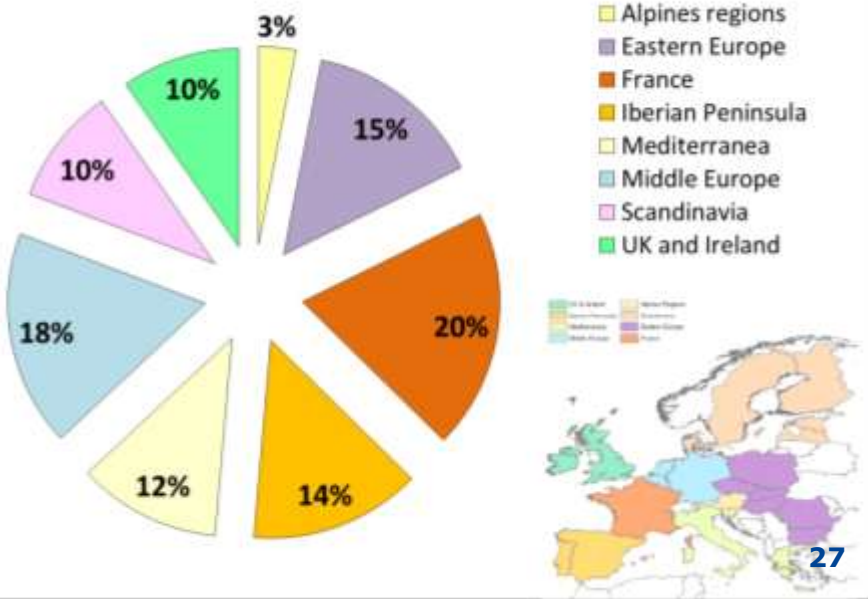
- Asphalt – cement – concrete – aggregates
- Sustainability of construction works
- Construction products – assessment of release of dangerous substances
- Drainage - noise

Market analysis



Length of total road network

EU Transport Pocket book 2013 + ERF statistics: **5.3 million km of roads, 1.3%** motorways
Data are not comparable from country to country



Data on EU production of road construction materials

Aggregates

- **2.8 billion t/y** (6% recycled – 2% secondary aggregate)
- At least **10%** used in roads
- in av. **20,000 t/km** for a two-lane road - **30,000 t/km** for a motorway

Asphalt

- **20 Mt/y bitumen**
- **300 Mt/y HMA** (hot mix asphalt) – **7 Mt/y WMA** (warm mix asphalt) - **3 Mt/y CMA** (cold mix asphalt)– increased use of **RAP** (reclaimed asphalt pavements) **56 Mt/y**

Stakeholders feedback: **96-97% flexible pavements**
It is unclear if this simply refers to **surface courses** or to all types of courses involving binders

Data on EU production of road construction materials

Concrete

- 156 Mt/y **cement** (2012). 556 Mt/y **ready mix concrete**
- EU road are 90% flexible and 10% rigid (NAPA and EAPA, 2011). Difficult to estimate the quantities of cement concrete used in road construction (around 2%?)

Lime

- 4 Mt/y lime (2012) – 10-15% in road construction

Waste derived materials and by-products

- **C&DW:** WFD set a target of 70% of reuse, recycling and recovery by 2020 – 341-531 Mt/y (recycling 46%)
- **Coal fly ash** 77 Mt/y (23% in road)- **bottom ash** 11 Mt/y (recycling 45%)
- **MSWI bottom ash: 20 Mt/y**
- **slag from iron and steel production: BFS** 26 Mt/y (13 MS in 2010), 30% recycled as aggregate - **steel slag** 21 Mt/y (55% in road)
- **reclaimed rubber from tyres** 0.5 Mt/y

Procurement volume and expenditure

According to stakeholders feedback

New road (km/y)

- UK: 190 lane km/y
- Turkey: 1,250 km/y

Maintenance need (km/y)

- UK: 1,500 lane km/y
- Italy: 1,341 km/y (in 2012) of highways and other roads of national interest (5% of total length of highways)
- The Netherlands: 300 km/y of motorway (10% of total length of motorways)

- Total expenditure in road maintenance **26 billion euro**

Technical and environmental analysis

LCA literature review

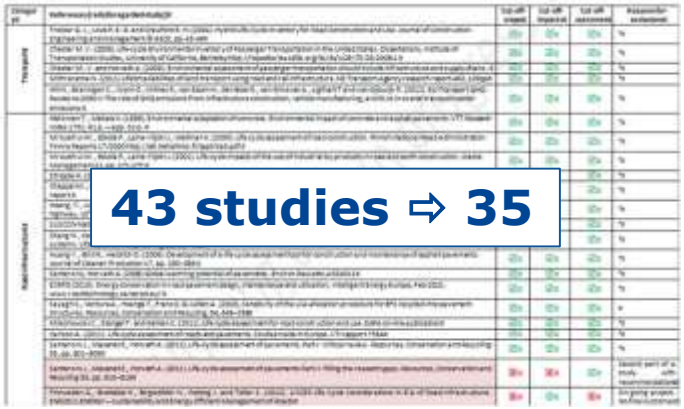
Step 1: preliminary identification of key environmental impacts

PCR for roads *"UN CPC 53211 Highways (except elevated highways), streets and roads" (ENVIRONDEC, 2013) + reviewed LCA studies*

1. **Energy consumption**
2. **Global warming**
3. Acidification
4. Photochemical ozone formation
5. Eutrophication

Step 2: Screening of studies

1) Minimal cut-off requirements
   - Functional unit (ISO 14040)
   - Scope coherent for the goal of the study
   - Assumptions



LCA literature review

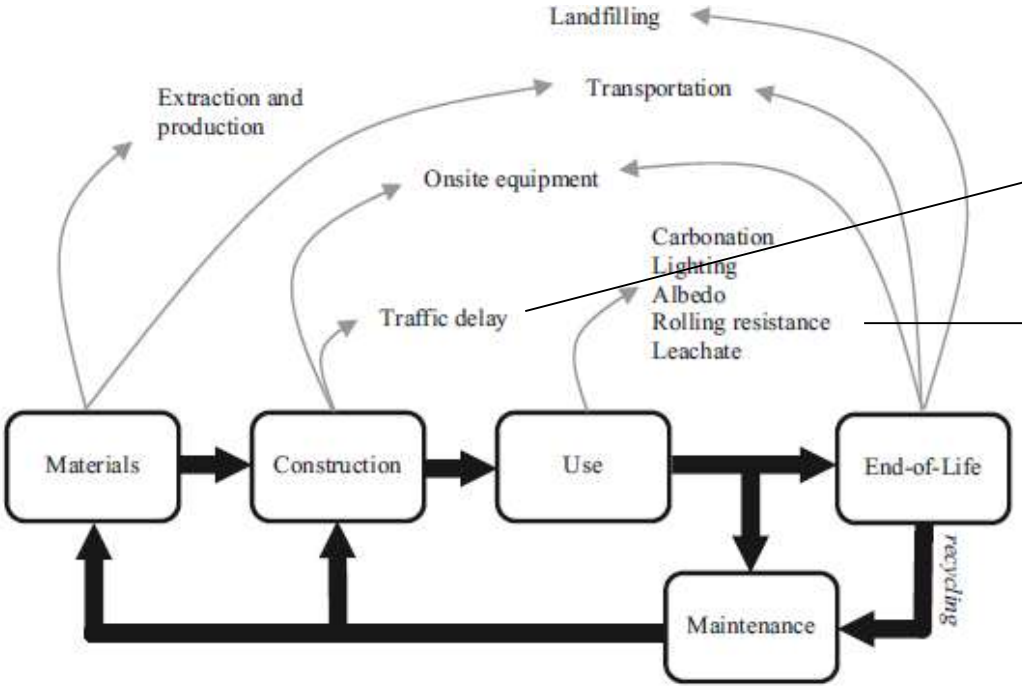
Step 2: Screening of studies

2) Scoring system according to screening rules

- Scope
- Data (temporal, geographical and technological representativeness)
- Impact assessment: broad environmental impact categories + ILCD
- Relevance of outcomes
- Robustness of the study
- Reliability: critical review

35 studies ⇨ 27
20 road infrastructure
7 supply chain

Assumptions in the selected LCA studies



Life cycle phases

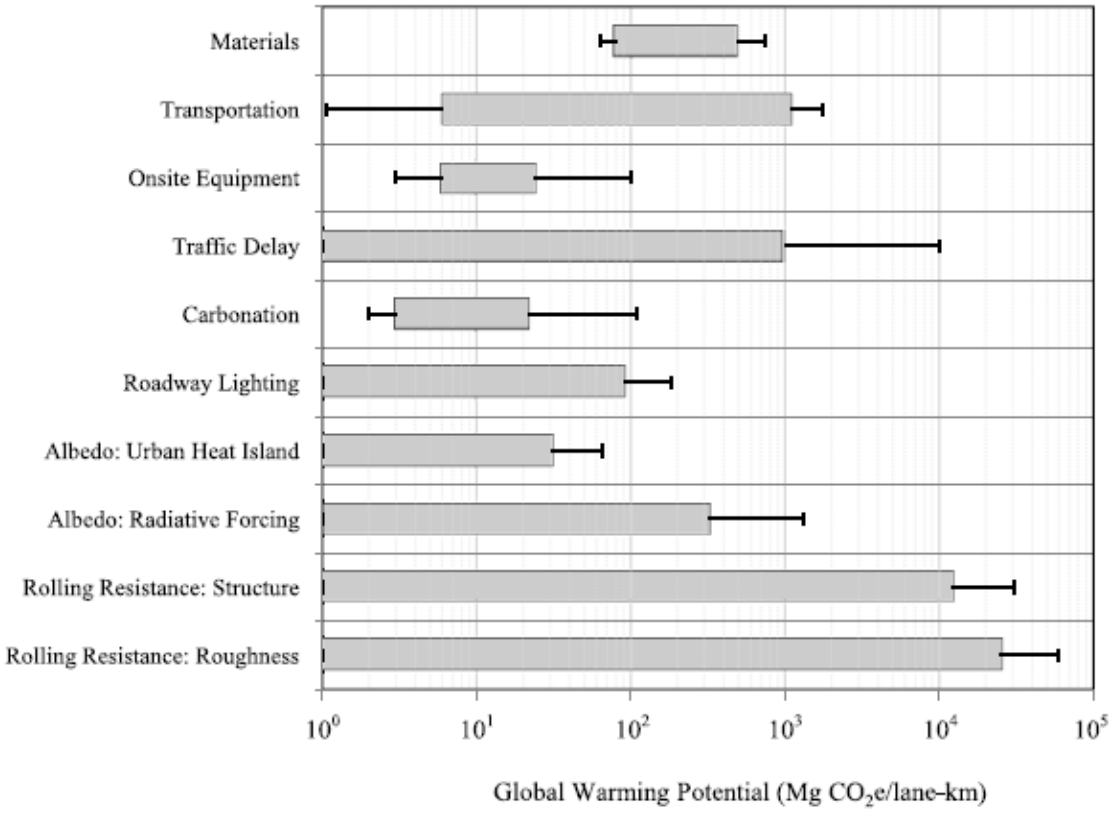
Congestion

Texture (MPD)
Roughness (IRI)
Deflection (movement of surface due to the traffic loading)

Service life: 30-50 y

All roads are **unique** ⇨ it is **impossible** to perform straightforward **comparisons** of the results due to the differences in approach, scope, functional units, analysis periods, system boundaries, regional differences, input data (LCIs)

Identified environmental hot-spots



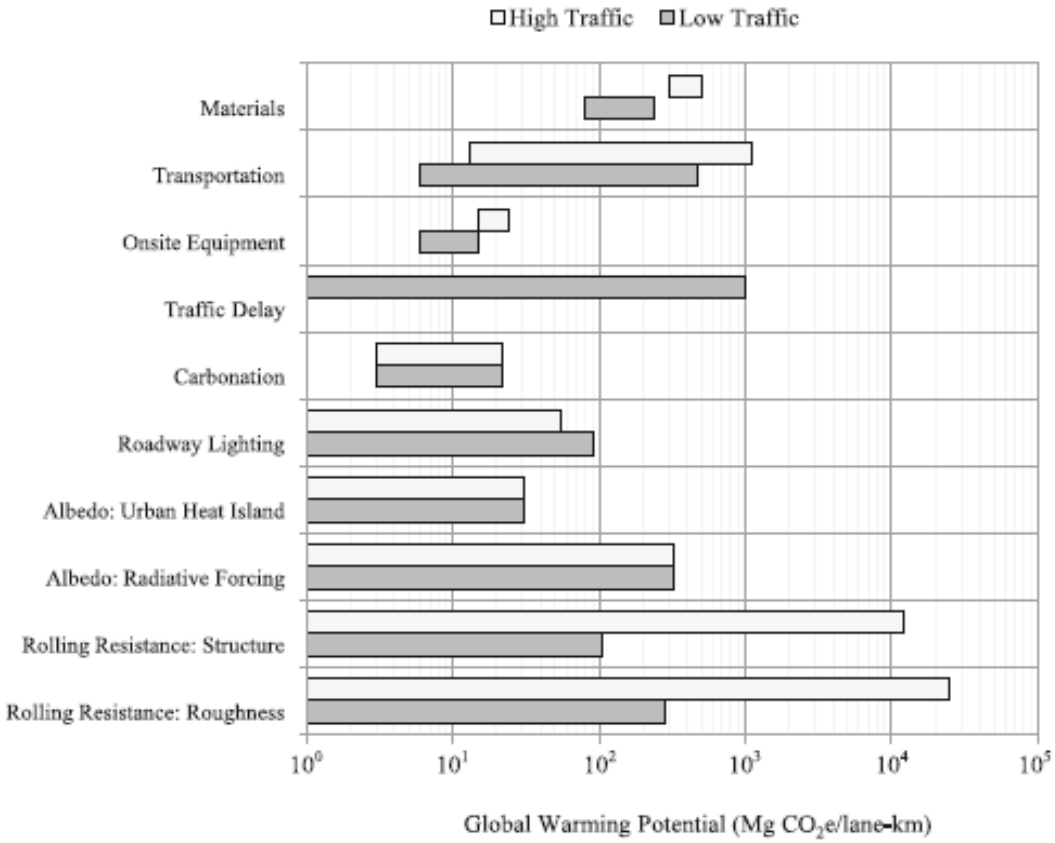
GWP impact ranges for components of the pavement life cycle (Santero and Horvath, 2009)

The main environmental impacts arising from daily traffic during the use phase

Rolling resistance (structure and roughness)

Congestion (prominent component on motorways and highways)

Identified environmental hot-spots



Comparison of GWP ranges for low and high-traffic pavements (Santero and Horvath, 2009)

low volume < 2000 AADT (AASHTO, 1993)

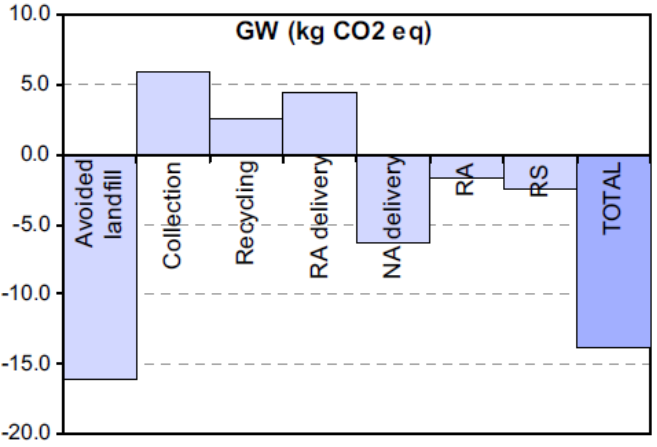
Influence of **traffic flow**

Second largest environmental impacts: **materials production** and **transportation**

- In **concrete** pavements, **cement production** and **concrete mix**
- In **asphalt** pavements, **bitumen production** and **asphalt mix**

No general rules on the choice of the materials, for example asphalt or concrete

Identified environmental hot-spots



(NA natural aggregates, RA recycled aggregates, RS recycled steel)
(Blengini and Garbarino, 2010)

Guidance of the main results from the literature review on **construction materials**

- **WMA** in substitution of HMA
- **Fly ash or calcium sulfo-aluminate cement (CSA)**
- **Recycled/secondary materials and by-products** + **transportation** (distance for alternative aggregate can increase 2-3 times compared to the distance of natural materials)

Earthworks: could accounted for the main part of the total emissions and up to 30% of the cost

Maintenance and rehabilitation: increased relevance: not a simple repetition of restoration and repairing activities, but a complex network of design strategies

Environmental hot-spots not identified by means of LCA

Storm-water drainage ⇨ huge opportunity for road drainage systems to provide much needed flood capacity

Noise emissions ⇨ low-noise road surfaces and noise barriers

Recent technologies in road construction materials

According to the stakeholders feedbacks:

- **Asphalt** (WMA-CMA, RAP, noise reducing asphalt, rubber asphalt, WMA with recycled plastic and wax, phocatalytic asphalt, cool pavement with nano-coatings, asphalt without bitumen, thin and ultra-thin layers)
- **Concrete** (high strength concrete, self-healing materials)
- **New pavement design**
- **Lime** for stabilization and in HMA
- **Patching materials** (for pothole)
- **Photovoltaic panels in/as the surface**

Proposed areas of focus for the GPP criteria

- **Pavement-vehicle interaction**
- **Congestion**
- **Resource efficient construction**
  - Asphalt
  - Concrete
  - Recycled and secondary aggregates and by-products
  - Soils
  - Materials transportation
- **Road drainage system**
  - Installing flood capacity
  - Road drainage system – reducing water pollution
- **Noise emission**
- **Waste management plan**

Questions on market analysis

- Do you have **additional data**?
- Could you provide additional reference / data on
  - procurements volume
  - forecast of constructed road and need of maintenance?

Questions on the LCA literature review

- Is there any **additional evidence** available?

Thank you

Road construction

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GPP draft criteria area
on **pavement-vehicle interaction**

Pavement-vehicle interaction

Rationale

Rolling resistance associated with **pavement structure** and **roughness** plays an important role in the **vehicle fuel consumption**

Wang et al. (2012a)

⇨ traffic during the **use phase** dominates the life cycle impacts of a road construction with **high traffic volume**: a **10% reduction** in the **rolling resistance** can lead to **1-2% improvement** in **fuel economy**

Pavement-vehicle interaction

Rationale

Wang et al. (2012b)

⇨ roads with **high traffic volume** (examples with 11200, 34000, 86000 AADT)

- when the **roughness** and **macro-textures** were improved, the **reduction in energy consumption** and **GHG emissions** can be significantly larger than the emissions from materials production and construction
- an **increase of surface roughness** (International Roughness Index IRI) of 1 m/km will increase the fuel consumption of passenger cars by about 2%, independent of velocity (for heavy trucks, increase of 1% at normal highway speed and 2% at low speed)

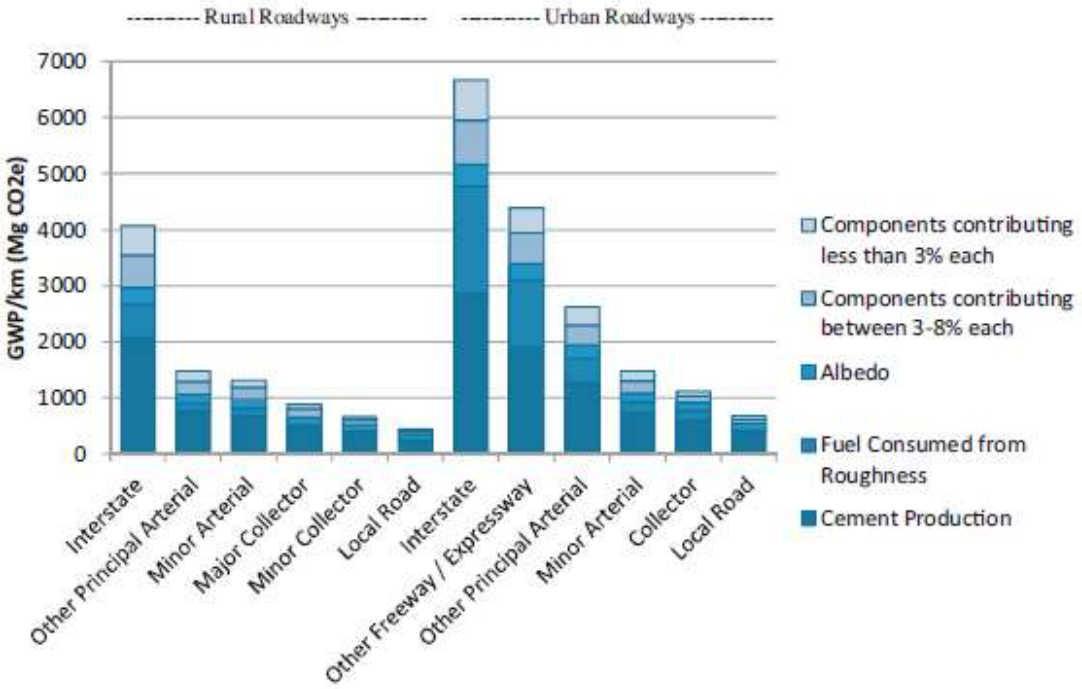
⇨ roads with **low traffic volume** (example with 3,200 AADT), the share of impacts from the use phase is reduced overall compared to the impacts from the material production and construction phases

Pavement-vehicle interaction

Rationale

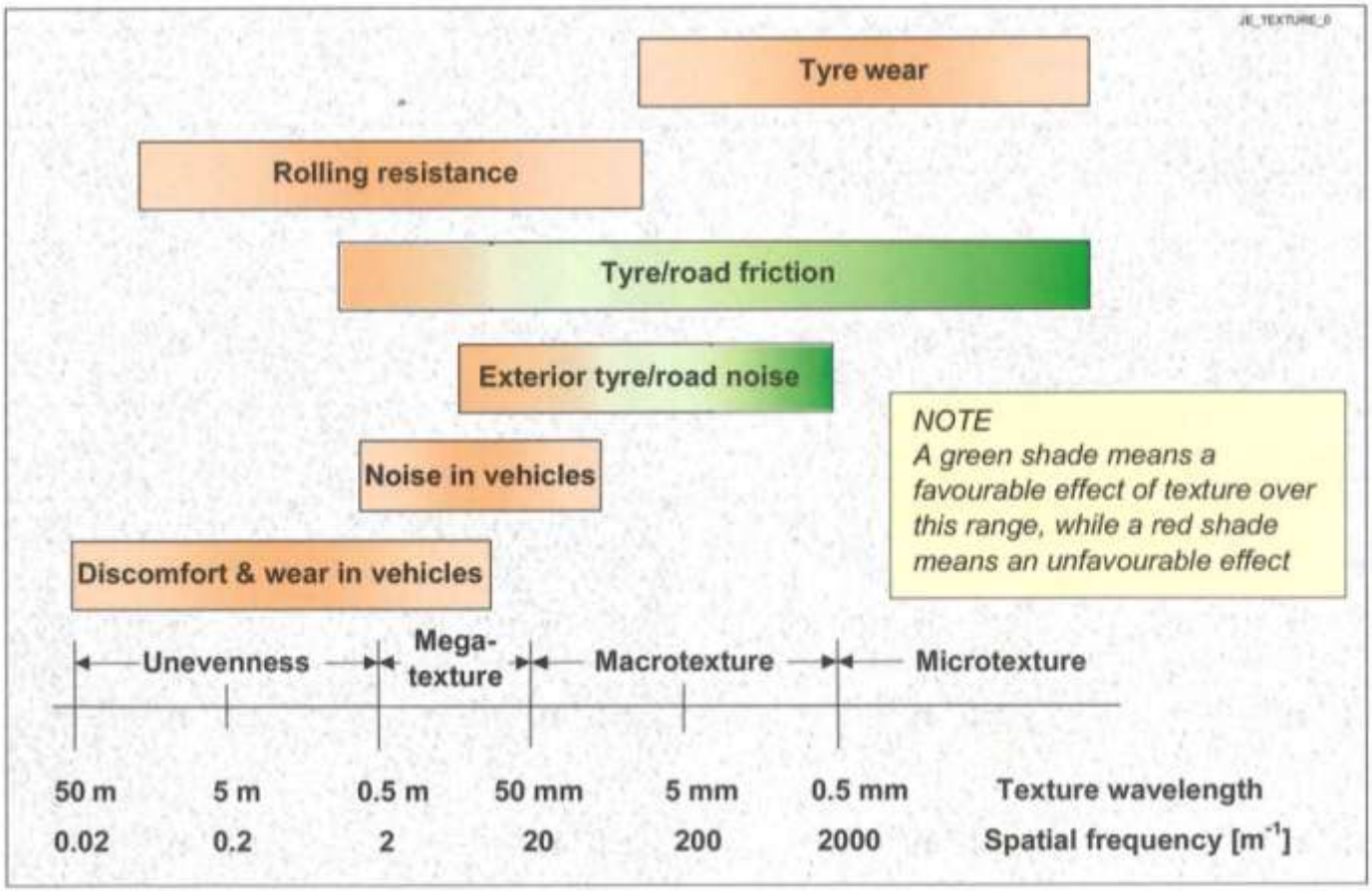
GWP of 1 km of the US concrete roadway network for **40 y** (Loijos et al. 2013)

- ⇨ **high-traffic flow roads (>2,000 AADT):** losses from vehicle-pavement interaction are an important factor that justifies their measurements
- ⇨ **low-traffic roads (<2,000 AADT):** fuel consumption during use phase is comparable to other life cycle phases



Pavement-vehicle interaction

Potential indicators



- ⇨ Rolling resistance
- ⇨ Texture
- ⇨ Longitudinal unevenness
- ⇨ Transversal unevenness
- ⇨ Surface defects

(Haider et al, 2012)

Pavement-vehicle interaction

Rolling resistance

Currently **no standardised methods**

EU FP7 projects (MIRIAM and COOEE)

The function that relates rolling resistance to **texture** (mean profile depth MPD) and **unevenness** (International Roughness Index IRI) parameters needs to be developed

Trailer method

Coastdown method

Laboratory drum

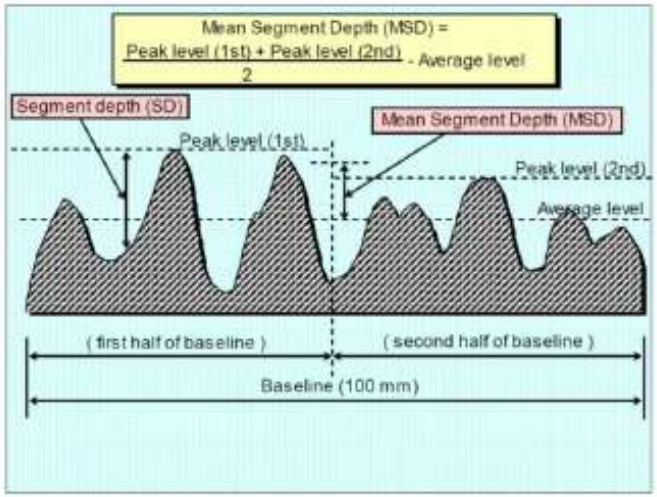
(pictures from Sandberg, 2011)

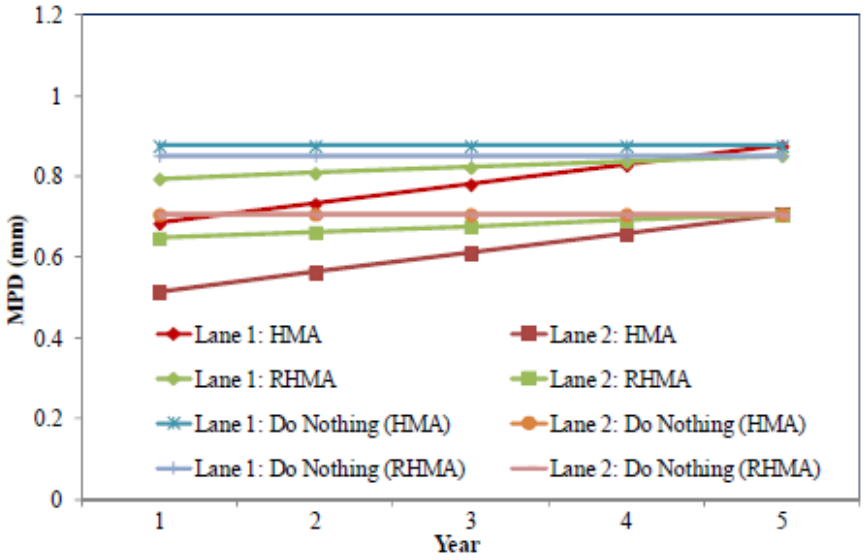
Pavement-vehicle interaction

Texture

The **ISO 13473-n:** measurement of pavement texture with profilometers

MPD (mean profile depth) is the most commonly used parameter





Wang et al., 2012b

Macrotexture is expected to both decrease and increase during the road use phase, and its progression depends on type of material, traffic flow and composition (heavy traffic) and climate conditions

Cost 354 "Selection and assessment of individual performance indicators" (COST, 2008)

MPD requirements in some EU Countries

COUNTRY	NAME	Performance indicator	THRESHOLD		WARNING		ACCEPTANCE		TARGET	
			TP	INDEX	TP	INDEX	TP	INDEX	TP	INDEX
CZECH REPUBLIC 1	Texture depth MPD	MPD	0,54		0,64					
CZECH REPUBLIC 2	Texture depth MPD	MPD	0,44		0,54					
FRANCE 1	Sand patch value MPD	MPD		40		60				

MPD thresholds in Sweden (under consideration)

MDP interval	90 - 110 km/h Motorways and other primary roads	70 km/h Secondary roads
0 - 0,3	Not suitable/very poor	Not suitable/very poor
0,31 - 0,5	Not suitable/very poor	Bad/poor
0,51 - 0,7	Bad/poor	Ok/very good
0,71 - 1,0	Ok/very good	Acceptable/good
1,01 - 1,50	Ok/very good	Bad/poor
1,51 - 2,00	Acceptable/good	Bad/poor
2,01 -	Bad/poor	Not suitable/very poor

Pavement-vehicle interaction

Longitudinal unevenness

Measurement of a longitudinal road height profile with a sampling interval of 0.05 m

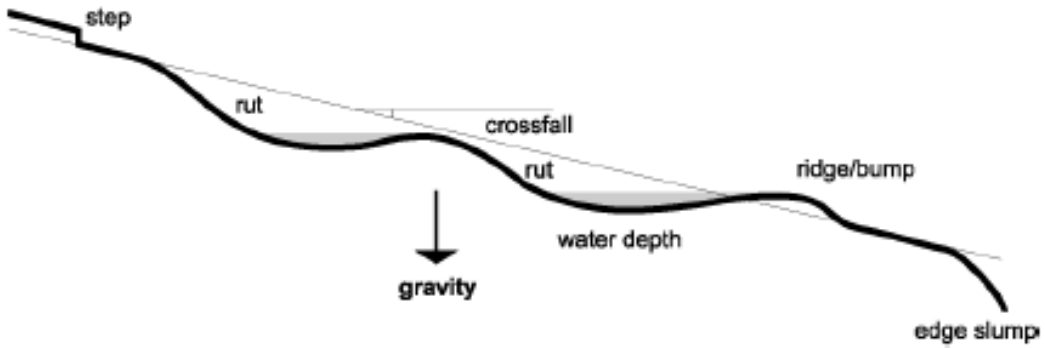
- **International Roughness Index IRI** (most common)

Influence on the vehicle energy consumption:

- Rolling resistance (less than texture)
- Vibrations in the wheel suspensions (conversion of mechanical energy into heat energy)
- High levels of longitudinal unevenness will induce drivers to reduce the vehicle speed

Pavement-vehicle interaction

Transversal unevenness



Transversal unevenness measurements by means of **EN 13036-6** and **EN 13036-8**, typically with a straightedge or a laser profilometer

Crossfall and **rut depth** typically constitute the major deviations from an ideal horizontal road surface

The main parameter used for transversal unevenness is average or maximum rut depth

Pavement-vehicle interaction

Surface defects

Surface irregularities as **joints or surface defects like cracks, ravelling, potholes, loss of material** may influence on longitudinal and transversal unevenness, and on texture

A classification of relevant surface defects would work as an indicator for the predicted additional fuel consumption

Other parameter that is related to the surface defects on the road pavement is the durability of the material, that should be considered together with the designed bearing capacity of the road

Pavement-vehicle interaction

Draft criteria area

1. **Evaluation of traffic conditions of the road**

- Low rolling resistance is **not suitable for roads with frequent stop-start traffic flows**, or frequent acceleration-deceleration (road with gradients)
- As preliminary step, it is recommended to evaluate the **traffic flow** planned during the road design
  - In the case of **high-traffic roads** (as motorways and highways), the parameters related to the **pavement-vehicle interaction should be considered** within the procurement process
  - In case of **low-traffic roads,** it is advisable **to focus on other criteria areas**

Pavement-vehicle interaction

Draft criteria area

2. Setting thresholds in relevant parameters

Some criteria options would be to

- **Setting a MPD performance**, within the safety range of values demanded by the road, and
- **Select the most durable materials** for the particular needs of bearing capacity
- **Monitoring** and **routine maintenance**
  - Monitoring of MPD and unevenness are recommended to be accompanying to thresholds that trigger the maintenance actions
  - Threshold limits for MPD might be defined by a range between minimum required values for skid resistance and maximum desirable values for limiting fuel consumption

Pavement-vehicle interaction

Draft criteria area

3. Integration in maintenance activities

This criteria area is linked to the **maintenance and rehabilitation activities**, thus the procurement process of these services should include a **requirement on a maintenance and rehabilitation (M&R) strategies preliminary plan** that includes:

- **Monitoring frequency** (< X years) and pavement performance assessment on all the parameters related to the pavement-vehicle interaction
- **Maintenance activities strategy**

A maximum interval for monitoring is recommended (in literature 5 years are suggested)

Questions

- Do you agree on the **criteria area on pavement-vehicle interaction** aimed at reducing the fuel consumption during the use phase?

- Do you agree on the **parameters proposed** and the phases where they are suggested to be defined, monitored and corrected? Would it be needed to evaluate the **climate conditions** in the case of the **MPD monitoring**?

- Is it possible to set **target/threshold values** for these parameters? Which constraints may be associated? Any input about this issue is very welcome.

- Which **monitoring frequency you consider to be optimal** to assess these pavement performance parameters?

Thank you

Road construction

1st Ad Hoc Working Group Meeting for the revision of the Green Public Procurement criteria

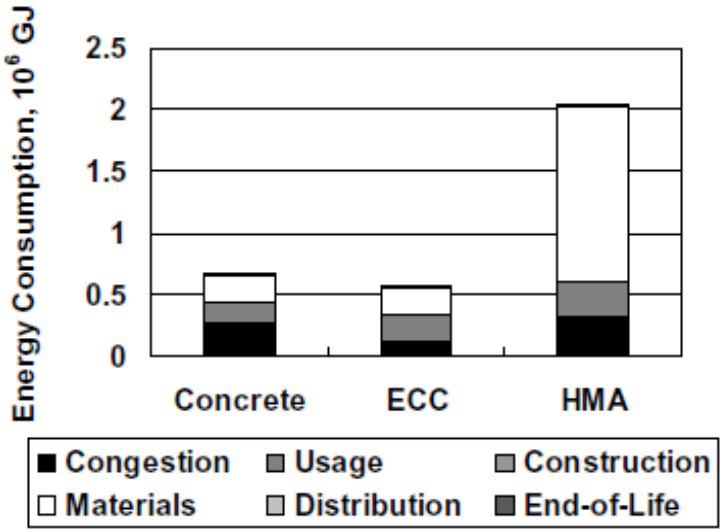
12th March 2014

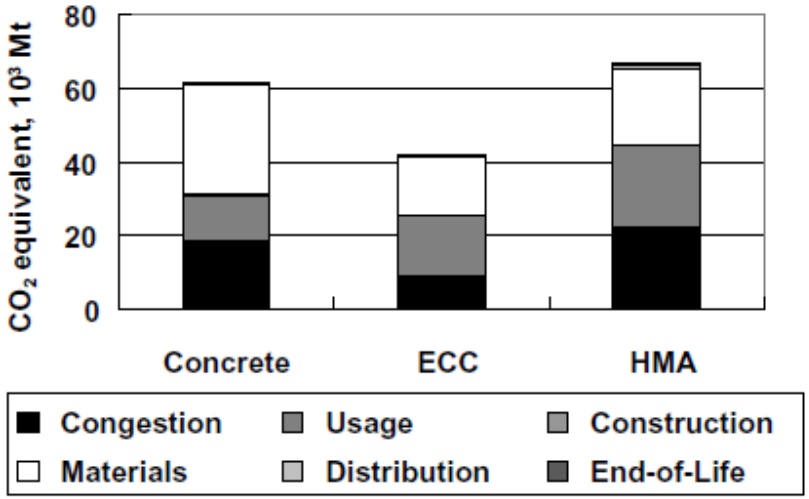
GPP draft criteria area
on **congestion**

Congestion

Rationale

- ⇨ caused by **lane** and **road closures** during road construction and/or maintenance (project specific). It influences the vehicle fuel consumption
- ⇨ **low traffic rural and local roads:** congestion impacts are **negligible**
- ⇨ **motorways** and **highways**: extra fuel consumption is a prominent component





ECC high performance concrete
HMA hot mix asphalt

Source: Zhang et al. (2008)

Congestion

Draft criteria area

Traffic congestion mitigation plan providing

- **timeline** including expected construction and/or maintenance activities during the road service life for an effective traffic management
- alternative routes for **diverted traffic**
- specification on the **use of hard shoulders**

Contract clauses committing the party responsible for planned maintenance to carry out such works **during off-peak hours** and **during off-season periods**

Equipment to inform the users part of the traffic management requirements

Questions on the draft criteria area for congestion

- How is road **congestion evaluated in your public authority**? Could you recommend **specific models** or **methods** of good practice?

- Would it be possible to set a **criterion to manage extraordinary maintenance works**, due to extreme weather events as floods or heavy snow fall, and other damages?

Thank you

Road construction

1st Ad Hoc Working Group Meeting for the revision of the Green Public Procurement criteria

12th March 2014

GPP draft criteria area
on **resource efficient construction**

Resource efficient construction

Rationale

Materials production and **transportation** are environmental hot-spots in **construction** and **maintenance**

Multiple factors influencing materials choice: geotechnical and hydrogeological conditions, common practices, climate, availability of natural resources and recycled/secondary resources and by-products, transportation, prices

The decision on applying GPP criteria on sustainable materials depends on the **local strategies** carried out by the PA (list of the most important materials defined in the planning phase) ⇨ the proposed criteria don't oblige contractors to only use certain materials but instead provide a **logical framework** which encourages the use of materials with lower environmental impacts

Resource efficient construction

Rationale

Main potential environmental savings

- *Assessment of Scenarios and Options towards a Resource Efficient Europe 2030 PE, DG ENV*
- *LCA literature review in the Preliminary report*

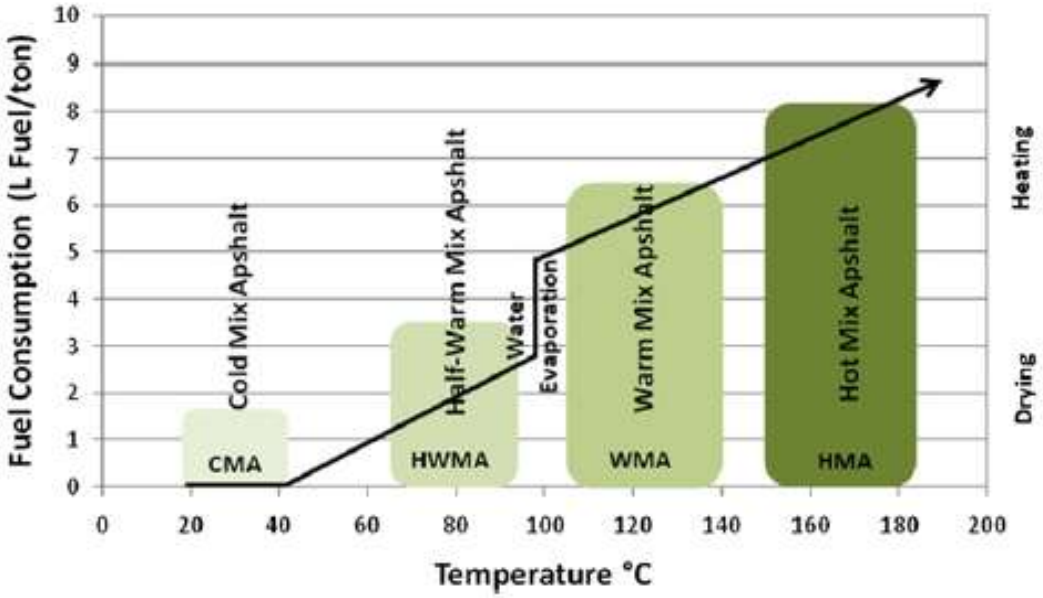
1. Recycling of **RAP** (reclaimed asphalt pavement)
2. **stockpiled fly ash** to replace cement in concrete or as aggregate
3. **WMA** (warm mix asphalt) in substitution of **HMA** (hot mix asphalt)
4. Use of **recycled aggregates from C&DW** in road base and building fill
5. Re-use **concrete and excavated soil**
6. **CMA** (cold mix asphalt)(not considered as prominent)

Asphalt
Rationale

WMA – HWMA - CMA

⇨ **lower temperature mixing** processes save energy and are associated with significantly lower emissions

⇨ improvement of the **health** and **safety conditions** of **workers**



Source: Rubio et al., 2013

⇨ **Performances** with WMA seem comparable to HMA (Capitão et al., 2012)

⇨ WMA is still 2% of the EU bituminous mixtures production but in France its production increased by 5 times from 2008 to 2012

Asphalt

Rationale

RAP

- ⇨ **re-used in asphalt mixtures** (from 7 to 50% by mass)
- ⇨ used as **recycled aggregates** (bound or unbound in road base and unbound in sub-base)
- ⇨ Production of **56 Mt/y of RAP** - 85% re-used into pavements (EAPA, 2013): well consolidated experience
- ⇨ Main benefits related to **avoiding** the need for **bitumen** production
- ⇨ Greater benefits are achieved by means of bound RAP rather than unbound in the sub-base (RE-ROAD project)
- ⇨ Concern about the coal tar content from old pavements

Asphalt

Draft criteria area

- **Any waste asphalt from mixing operations** either on-site or in an asphalt plant off-site should be **re-incorporated into later asphalt mixes** to result in zero waste of asphalt
- **Any RAP used from older pavements (> X yrs)** shall be tested for **coal tar content** and pre-treated to remove the tar if necessary

Potential award criteria – additional points for

- use of **lower temperature asphalt mixing operations**, specifying the mixing and laying temperature
- planned maintenance and rehabilitation accounting for **100% re-use** of **RAP** into **new asphalt** (national legislation and EN 13108-8). Re-use in new asphalt mixes for surface courses > re-use in bound base courses, without awarding reuse of RAP in the sub-base course
- Specification of the **% RAP in the asphalt mixtures** employed during construction

Questions on the draft criteria area for low temperature asphalt

- Do you agree in considering **WMA/HWMA/CMA**? Would it be better to simply focus the criterion on **WMA**?
- What is your opinion on the **performance aspects of WMA vs HMA**?
- What **temperature limits**, if any, could be set for laying of asphalt?

Questions on the draft criteria area for RAP

- Do you agree about criteria for **RAP content** in all the asphalt mixtures? Should a **minimum percentage** be specified?
- Should waste from mixing operations in **off-site asphalt plants** also be defined as **RAP**?
- Would it be better to require that **all RAP be reused onsite** during maintenance operations (WFD)?

Questions on the draft criteria area for RAP

- Do you agree with the requirement for a) **analysing for coal tar** in RAP and b) if sufficiently high in tar, then **pre-treated RAP** prior to reuse? Could you provide information about the age of the roads that should be covered by this criterion? What would be a **reasonable limit** and **test method** for coal tar in RAP?

- Do you see the possibility for **any technical specification**?

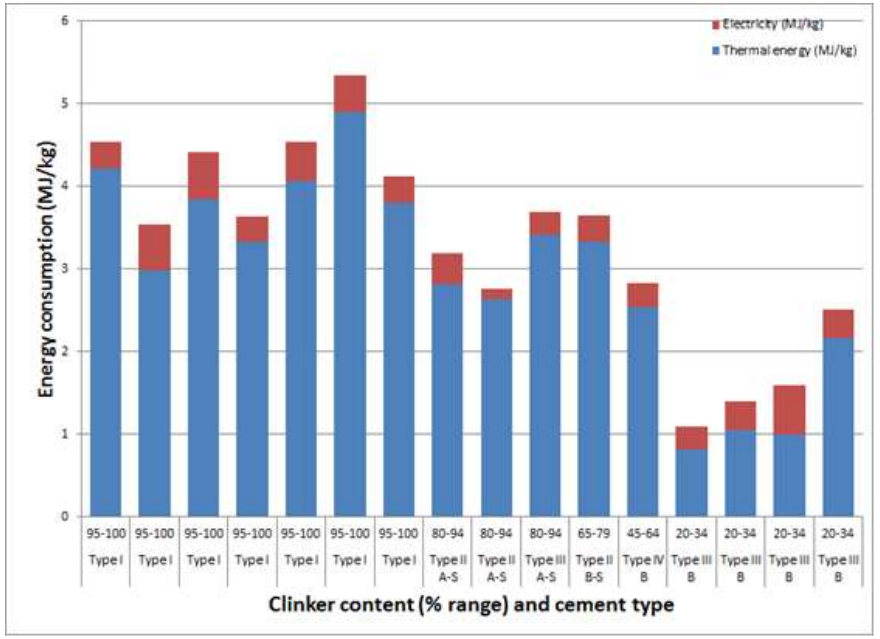
- Do you foresee any problems with the **verification** of this criterion?

- According to stakeholder feedbacks, in EU the main pavement layer type is the **flexible**. Is this data referred to the **surface courses** or to all types of courses involving binders?

Concrete

Rationale

- **Cement** has the highest environmental impacts
- improved kiln technology and use of alternative fuels for kiln firing are in an advanced stage
- reduction of the **"clinker factor"** (0.95 for CEM I Portland cement = 95% by dry mass clinker)



Source: Josa et al. 2004

- Cement clinker replaced by a number of "**supplementary cementitious materials SCM's**" (i.e. coal fly ash, blast furnace slag or natural materials)
- **CEM II-III-IV and V**: 6-55% clinker replacement – 95% with BFS
- Prices and availability in the EU market

Concrete

Draft criteria area

Potential award criteria – additional points for

- **Portland cement** with **higher contents of SCM's** will be scored higher due to the implied **lower clinker content** and lower associated environmental impact. Where ranges of clinker only are supplied, different cements with the same range of clinker content shall be scored equally

- Aggregate from **wasted batches of fresh concrete** (from testing procedures at the ready mix plant) will be reclaimed by washing with high **pressure water jets**

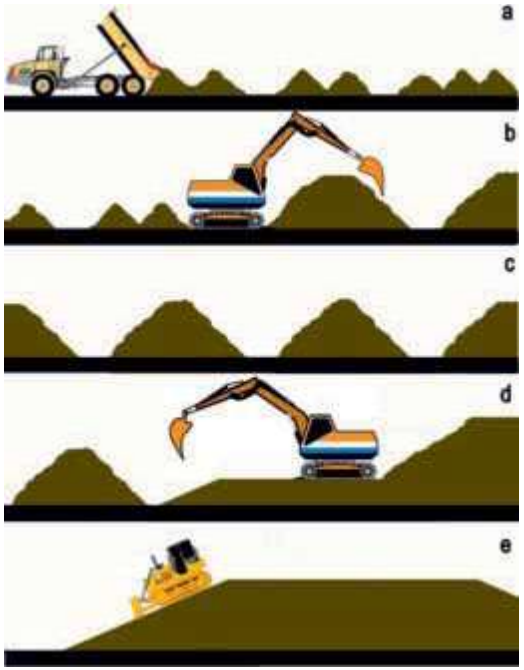
Questions on the draft criteria area for concrete

- Do you agree that the **clinker content** of the cement used is a reasonable criterion? Difficulties in verification?
- What are the **key technical specification** for concrete in road construction?
- Should the **cement quantity** of the concrete also be an award criterion? (i.e. kg cement / m^3 concrete)?
- Is the **EN 206 standard sufficiently robust** for the **verification** of cement and concrete technical specifications? e.g. fresh and hardened concrete
- Would it be relevant to mention **other cements** that are not based on Portland cement?

Soils

Rationale

- **re-use of soil** is strategic in the WFD
- **excavation waste** (1350-2900 Mt/y) is significantly larger than what is defined as C&DW (341-531 Mt/y)
- LCA review: in complex orography, earthworks impacts can account for the main part of total emissions and account for up to 30% of the project cost (Hampson et al. 2012; Barandica et al., 2013)



Source: DEFRA, 2009

- Where soils are unsuitable as sub-grade material, relative environmental impacts and economic costs of **excavation and replacement vs in-situ stabilisation** must be considered (Mroueh et al., 2000)
- Valuable **topsoil managed separately** and reincorporated into the site, particularly in greenfield

Soils

Draft criteria area

Soil management plan. Points awarded as a function of:

- Specifying **quantities of soil** to be moved permanently offsite and an **overall site soil balance**. The tender will be evaluated on the base of the larger proportion of soil reused in the worksite (closed soil balance may be evaluated higher)
- With soil not suitable as sub-grade material, **evaluation of the lowest environmental impact stabilisation option**s (for example, at the same % addition, impacts ordered as Portland cement>lime>lime+fly ash)
- **Management strategies** with **separate management** of **topsoil**
  - areas of soil to be protected from earthworks and construction;
  - areas, types and volume of topsoil and subsoil and stockpile locations;
  - methods for stripping, stockpiling, re-spreading and ameliorating
  - expected after-use for each soil

Questions on the draft criteria area for soils

- Could the criterion on a **soil management plan** be applied? Any experience around?
- How is the decision on **which soil stabilisation agent** to use reached in real-life projects? If environmental criteria are a factor, how are these evaluated?
- Would it be advisable to **set a minimum percentage of excavated soil to be re-used on site**? As **technical specification**?
- Do you foresee any problems with the **verification** of this criterion?

Recycled and secondary aggregates and by-products

Rationale

- **CPR 305/2011**: primary, recycled and secondary materials
- **Recycled aggregates** produced from processing materials previously used in construction
- **Secondary aggregates** and **by-products** arise from industrial production (coal combustion ashes, slags from iron and steel, MSWI bottom ash, reclaimed rubber, etc.)
- **Unbound** (EN 13285/13242) or **bound mixtures** (EN 13242/13043)
- National limit values for **leaching** (EN 12457). Associated classification schemes and/or quality assurance to certify the recycled product (BRV et al., 2007; standard LAGA 20; Setra 2011; WRAP 2005)
- Some LCA studies state that recycled aggregate has a lower impact than natural aggregate only as long as the transport distance is less than up to **three times**

Recycled and secondary aggregates and by-products

Draft criteria area

- Sources and transport of recycled/secondary and natural aggregates
- Where the **transport distance** from the recycled aggregate source is **<3 times** longer than that from the natural aggregate source, the bidder shall request **conformity of production** information relevant to **legislation in place** of use from the supplier of recycled/secondary aggregate. The bidder shall then evaluate the aggregate according to relevant EN standards relevant to final use of aggregate
- Additional points awarded for using recycled or secondary aggregates and stating the % proportion of total aggregate usage

Materials transportation

Rationale

Mass haul, "the **movement of soil, aggregate and rock**", is a significant producer of GHG emissions related to fuel consumption. These materials easily account for over 90% of all material mass transported in road construction (Hampson et al., 2012)

Draft criteria area

Materials	**Source**	**Destination**	**V Volume**	**g density**	**d Transport distances**	**Eventually uphill and downhill Dz**
			(m^3)	(kg/m^3)	(m)	(m)

⇨ **Design phase**: **baseline mass haul plan** (predefined locations and optimal solutions)

⇨ **Construction/maintenance**: **practical mass haul plan** constantly updated

Waste management plan

Rationale

WFD target of 70% re-use, recycling and other **recovery,** including backfilling**, of C&DW by 2020:** existing level of recycling and re-use varies greatly (10-90%, in average **46%** (BIOIS, DG ENTR 2011)

Draft criteria area

- A **waste management plan** for the construction/maintenance /decomissioning project (technical specification)
- The plan shall demonstrate how, for example as **core criteria**, that at least **70%** of C&DW shall be prepared for re-use, recycling and other material recovery, and referring to RAP and any other bound or unbound materials present in pavement layers. A suggested **comprehensive** level could require **>90%**
- The materials itemised in a Demolition Bill of Quantities (% re-use potential + % recycling and recovery)

Questions on the draft criteria area for recycled and secondary aggregates and by-products

- Are the terms **recycled** and **secondary aggregates** appropriate?
- Should there be a **minimum recycled content** for recycled and secondary aggregates to be included as a **technical specification**?
- Should recycled/secondary aggregates be **limited** only to **unbound applications**?
- Do you have any evidence that the **transportation rules** for alternative materials could be applied also to **by-products**?
- Do you foresee any problems with the **verification** of this criterion?

Questions on the draft criteria area for materials transportation

- Do you think the **haul plan functional unit** should be km, tonne/km or something more generic like total fuel consumption?
- Would any **award criteria for fuel efficient trucks** be of relevance? For example, data for relatively new trucks in terms of CO2 emissions per km
- Would **fuel consumption** be **easy to verify** (for example via GPS online truck fuel consumption systems)?
- What is your opinion on **including a contract clause** requiring that the contractor must demonstrate sufficient economical/environmental **justification for any deviation in the practical mass haul** from the baseline mass haul plan?
- Do you see any problem for the verification of this criterion?

Environmental performance improvement of road (based on LCA)

- ⇨ **resource efficient materials** with low energy and resource consumption and related emissions during the full life cycle of the materials could be also evaluated by means of a **LCA analysis**
- ⇨ To be taken into consideration:
  - transportation distances
  - need for maintenance over the service life
  - road use phase (i.e. less durable road surface could be justified if it presents a lower rolling resistance and thus lower fuel consumption for vehicles)

- ⇨ **CEN TC 350 WG 6**: working on a framework for the assessment of sustainable performance of civil engineering works and calculation methods

Environmental performance improvement of road (based on LCA)

Several tools, mainly focused on CO2 emissions, country-specific

- Dubocalc contains a detailed inventory of Dutch data
- Aspect (asphalt pavement embodied carbon tool) and Aggregain of UK data
- CHANGER
- SEVE (used in France)
- ROAD-RES in the Scandinavian countries
- Joulesave
- CO2nstruct
- EU research project CEREAL (CO2 Emission Reduction in roAd Lifecycles) is developing a tool that will be concentrated on maintenance and rehabilitation activities in Europe

Questions on the environmental performance improvement of road (based on LCA)

- Shall the procurer **award points** based on the improvement in the **life cycle performance** of the main road elements? In that case, which would be an optimal approach?
- Is it **realistic** to ask for an **LCA for all road construction projects** or only projects above a certain scale?
- Do you think that the **LCA criteria could potentially substitute other criteria for materials** previously mentioned?
- Would it be too complicated to include the **use phase** in the LCA assessment to due uncertainties over the final surface roughness/rolling resistance on vehicle fuel consumption?
- Could the selection of a preferred pavement design be based on an assessment of the material types by the presentation of available Ecolabels or EPD (according to EN 15804)?

Thank you

Road construction

1st Ad Hoc Working Group Meeting for the revision of the Green Public Procurement criteria

12th March 2014

GPP draft criteria area
on **road drainage system**

The road drainage system

Basic design aim: to prevent storm-water accumulating on the road surface

Main environmental impacts:

1) Flooding
(a **quantity** thing)

2) Watercourse pollution
(a **quality** thing)

Consider these as separate criteria

1 - Flooding

Rationale

Flooding in the EU during the period 1998-2009 resulted in insured economic losses of **€52 billion** and the displacement of around **500,000 people**

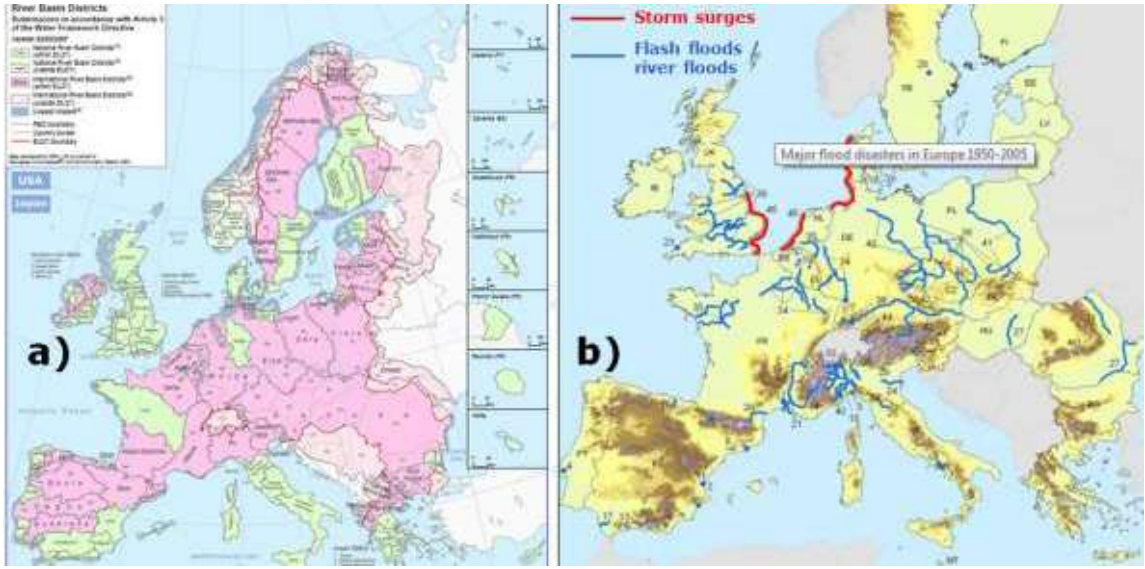
- ⇨ Traditional systems convey water **rapidly** to watercourse
- ⇨ A need for modern drainage systems that **retain** storm-water and only release it **slowly**
- ⇨ A need for extra **storm-water retention capacity**
- ⇨ Road drains cover large areas and often run across public land → great **opportunity** for installing capacity

Should drainage criteria be standard?

Across EU – No **Across river catchment - Yes**

Rationale

- Huge range of climates across the EU
- Flood risk is managed at catchment level
- EU Floods Directive 2007/60/EC
- Co-operation between neighbouring authorities needed



1 - Flooding

Draft criteria area

The drainage system shall be shown to not induce flooding onsite or increase run-off rates to watercourses under a **specified design storm event**

Verification shall be by modelled hydraulic simulations and visual inspection/technical drawings prior to adoption

2 - Water pollution

Rationale

Road drainage represents the **input** of a significant range of other **pollutants** to watercourses.

- ⇨ **Zn** and **S** in tyre particles (up to 9,000mg/kg and 12,000mg/kg)
- ⇨ Variable loads of **Na, K** and **Cl** due to the use of road grits
- ⇨ **PAH's** from deposition of exhaust gases/particles
- ⇨ **Oils** and aromatic compounds from vehicle leaks
- ⇨ Metals from brake pad wear (**Cu, Zn, Fe, Ni** and **Cr**)
- ⇨ Precious metals (**Pt, Pa** and **Rh**) from catalytic converters

LCA review ⇨ **salt from de-icing** operations can be the dominant factor behind **ecotoxicity** during the road use phase

Drainage solutions that reduce pollution

Three main pollutant types:

1. **Soluble species.** → difficult to control once emitted
2. **Suspended solids / colloidal matter** → sedimentation/filtration
3. **Floating species (litter, leaves, oils/fats)** → underflow devices

Two main types of drainage system components:

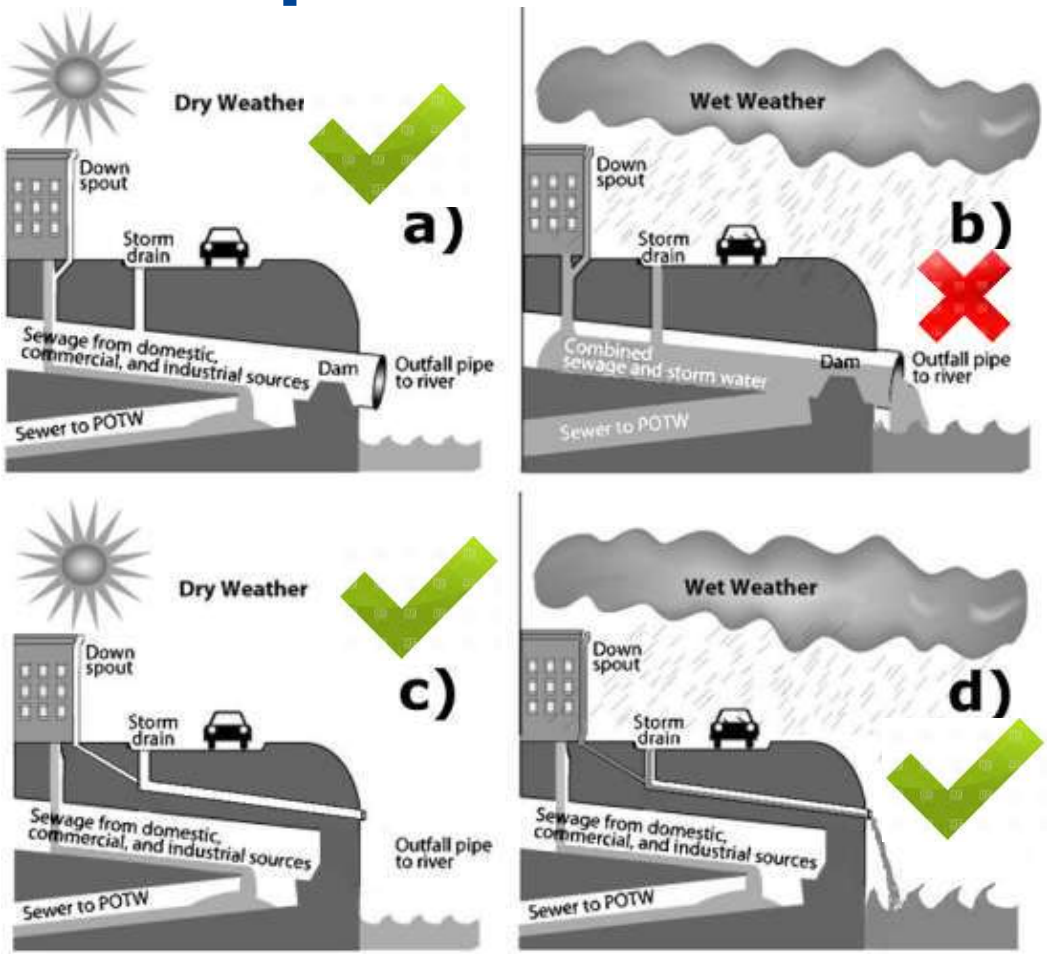
Hard engineered
(more concrete based)

Soft engineered
(more earth based)

- **Dozens of examples of each.**
- **With specific +ve's and –ve's.**
- **Hard and soft components can be combined in same system.**

Optimum solution will <u>depend on site specific conditions</u>

The problem with combined sewers



- Often the "easy option"
- Often original sewer design was decades ago
- Today many sewers already at full capacity
- During heavy storms, raw sewage → watercourse
- Combined sewers complicate correct operation of WWTP

2 - Water pollution

Draft criteria area

1. That road drainage should **not** be connected to combined sewers.
2. Specifying the drainage system to achieve a minimum degree of **sediment removal** efficiency and **oil interception** capacity.
3. If the road surface is non-porous, **grit** (lower salt content) and not road salt shall be used for de-icing.

Possible award criteria

a) The installation of **soft engineered** drainage components (**i.e. SuDS**) with proven sediment removal capacity

b) The installation of **soft engineered** drainage components (**i.e. SuDS**) for habitat creation / better aesthetics

Questions to stakeholders – 1: flooding criteria

- Any examples of **design storm events** in road construction contracts?
- Any examples of **calculation methods** for defining design storms in your Member State?
- Experience with **minimum drainage system capacity requirements** in road drainage systems?
- Roles and responsibilities before authority **adopts** drainage system?
- Experiences of **upgrading** existing drainage systems?

Questions to stakeholders – 2: water pollution criteria

- Is it realistic to define a **minimum degree of sediment/oil removal capacity**? Can this be verified or is design enough?
- Would separating storm sewers potentially cause a problem with **poor flushing** of sewers (i.e. sewers with low longitudinal gradients)?

Thank you

Road construction

1st Ad Hoc Working Group Meeting for the revision of the Green Public Procurement criteria

12th March 2014

GPP draft criteria area
on **noise emissions**

Noise emissions

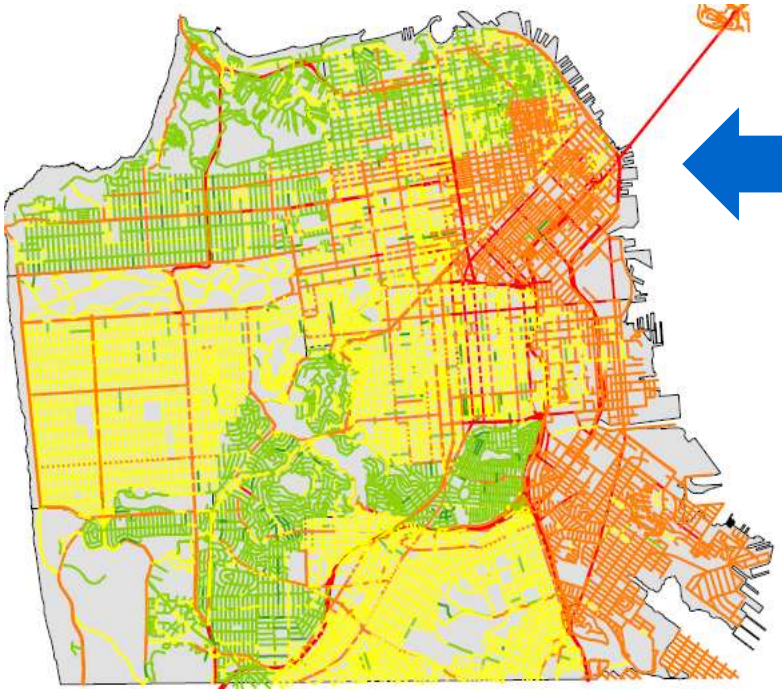
Rationale

Environmental noise is a serious issue in the EU

- reflected in Directive 2002/49/EC

- MS → produce noise maps for i) roads with >6m vehicles/yr

ii) urban areas >250,000p



Noise map of San Francisco*:

- **Looks like a road map**
- **Or a traffic density map**

Because

the dominant source of environmental noise is TRAFFIC.

*from University of California Berkeley library

Types of noise emissions from traffic

Three main sources of emission:

1. Engine noise
2. Tyre-road surface contact
3. Air turbulence

The only source directly relevant to road construction.

But installing noise barriers can help reduce all 3 (in target areas)

Therefore two potential criteria areas:

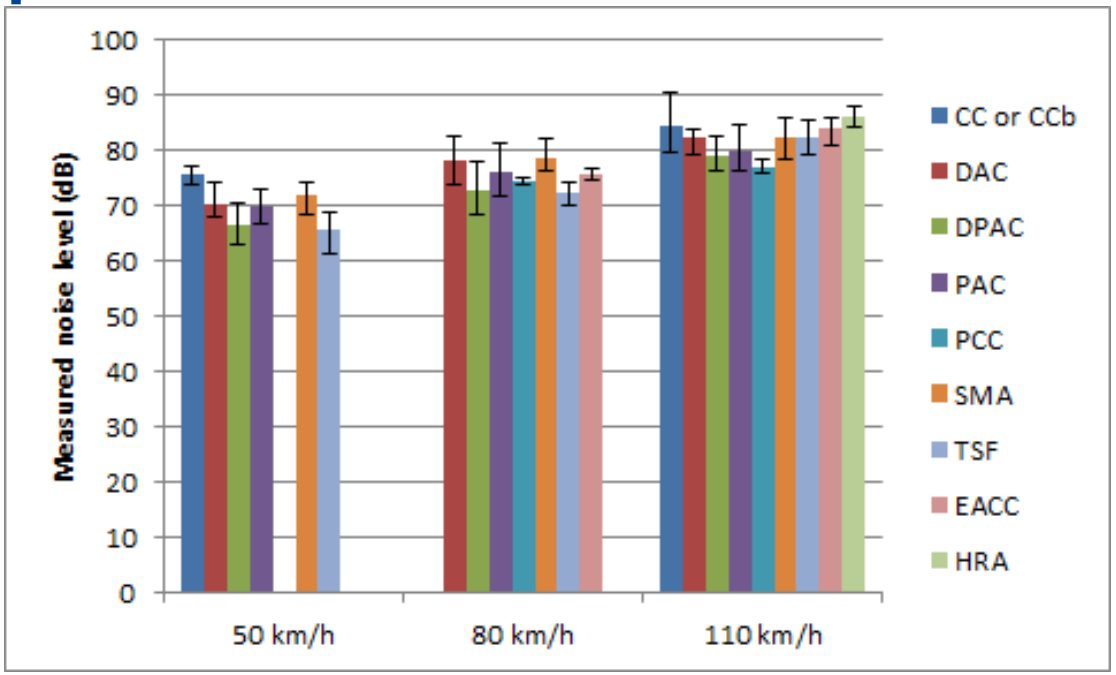
1. **Road surfaces (reduce noise emission)**
2. **Noise barriers (shield receptor from existing noise)**

Road surface criteria:

The key road surface properties are:

a) Texture

b) Porosity



What surface is best?

- Vehicle speed
- Vehicle type
- Envi. Conditions
- Age of surface

Porous surfaces generally good but need more comprehensive data for all surface types

Low noise pavements

Draft criteria area

- The road surface type specified shall **be proven** to present noise reductions compared to normal road surfaces based on laboratory studies and literature.
- For porous surfaces, **the open porosity of test mixes** by the contractor shall be measured as per relevant EN standards.

Possible award criteria

- Measurement of road surface macrotexture prior to opening
- Measurement of noise emission via SPB + CPX methods prior to opening
- Monitoring of noise emission of same road section by SPB and CPX at regular periods during the lifetime of the road

Noise barriers

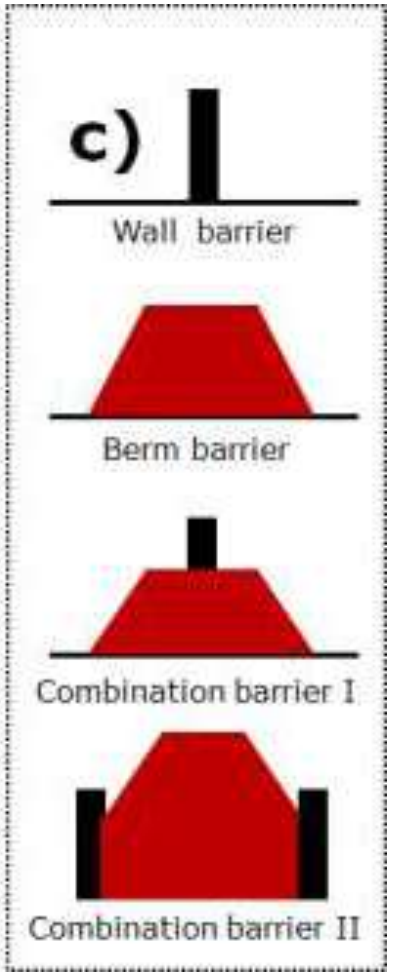
Rationale

Many different noise barriers available:

- **Different structures**
- **Different materials**

More control and testing experience regarding acoustic performance than with road surfaces:

- **CEN/TS 1793-5, EN 1793-6**
- **EN 14388 and 14389**



Draft criteria area

The noise reduction requirement of the noise barrier between a defined source and receptor area shall by X dB (where X is any value ≥5 and typically ≤20 and chosen by the procurer)

Questions to stakeholders

- Should there be a mandatory requirement for a shift to low-noise pavements?
- If so, should this be only in certain situations (like free flowing/ accelerating traffic sections) or by default?
- Is it feasible to require macrotexture analysis of new road surfaces? If so, what values would be specified?
- Any suggestions/opinions about possible award criteria related to materials used in noise barriers?
- Should criteria for noise only apply to road construction projects above a certain minimum scale? If yes, which scale?

Questions to stakeholders – verification

- Is there any existing relationship between the authority responsible for noise mapping in agreement with Directive 2007/60/EC and road maintenance authorities? Any experience in such partnerships could be of significant interest.

- Would the availability of specialised equipment/personnel for road surface assessment for macrotexture and noise emission be a problem in your Member State?

Thank you

Road construction

1st Ad Hoc Working Group Meeting for the revision of the Green Public Procurement criteria

12th March 2014

Preliminary information on the **guidance document** for road construction **procurement**

Preliminary information for the guidance document for road construction procurement

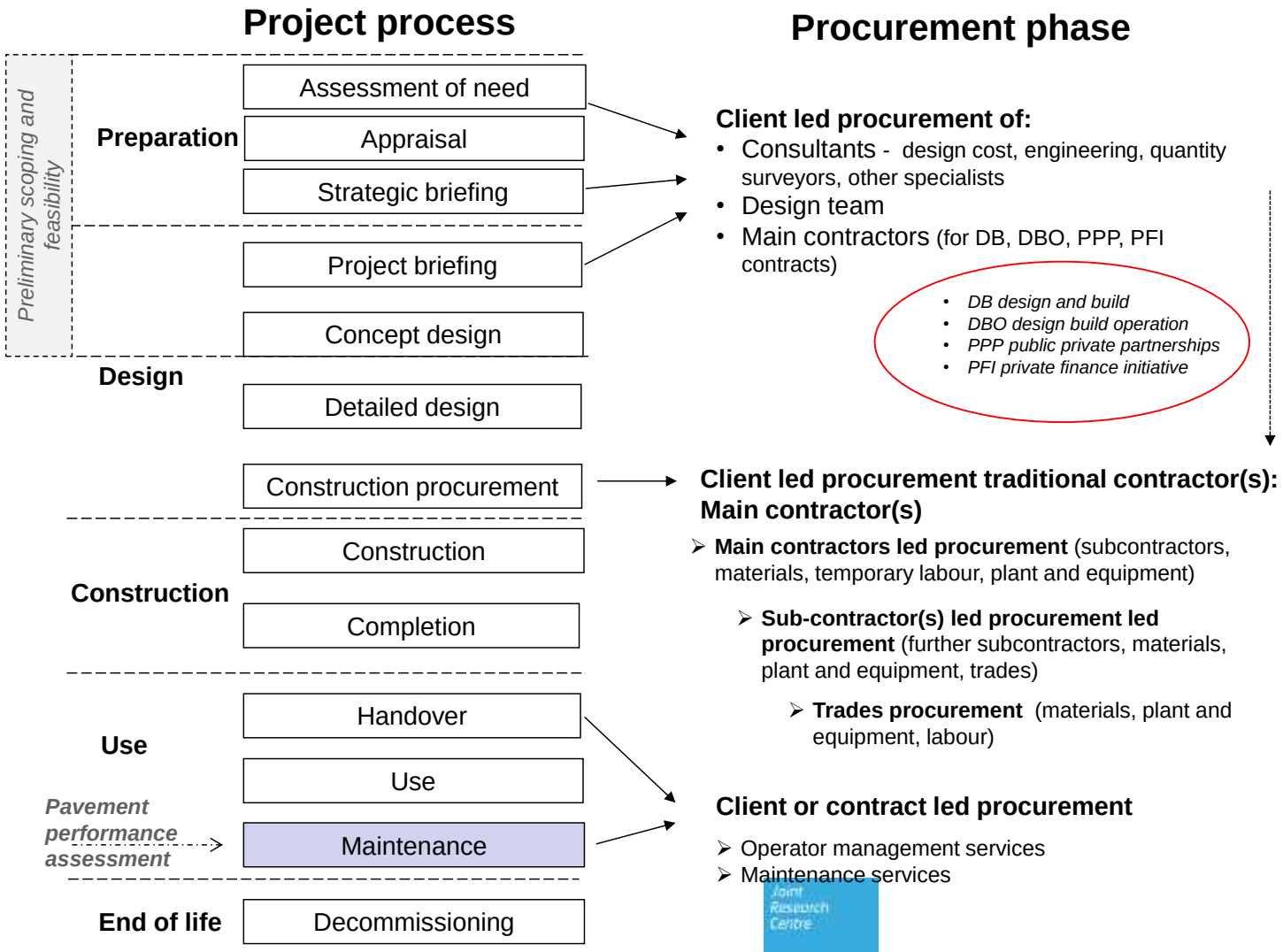
aimed at providing procurers with orientation on **how to effectively integrate the GPP criteria** for road construction **into the procurement process**

Taking into consideration the common contracts employed in road infrastructures

- Separation of design (**D**) and build (**B**) works
- Design and Build (**D-B**)
- Design, Build and Operate (**D-B-O**) with project financing (**D-B-F-O**)

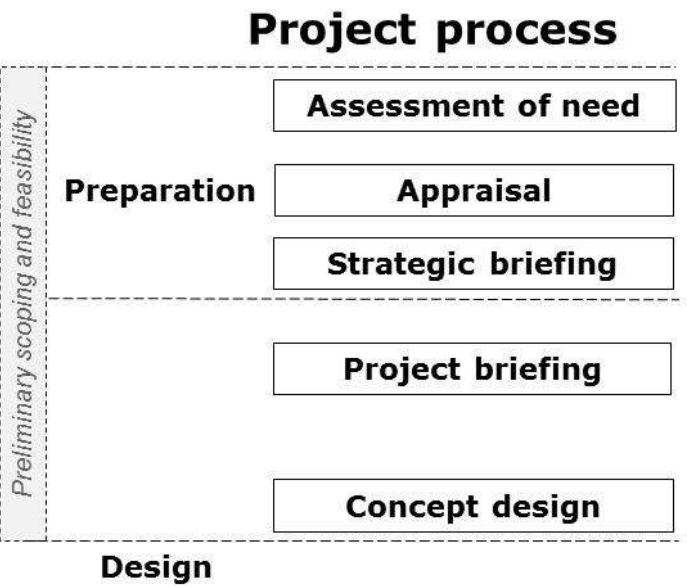
According to SCI guide

Indicative sequence of procurement activities



PPP contracts are widely used in road construction

ECI Early Contractor Involvement when there is significant scope for input from the supply chain



Strategic level – master plan. First discussion on alignments

In-house or **ITT** for consultants
Feasibility study: least **LCC**

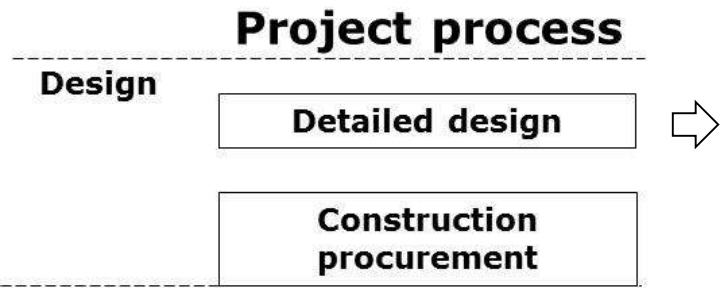
Sufficient detail including inputs on materials, alignment and transport requirements for the CBA, EIA/SEA

Environmental planning: SEA
Fundamental for road network planning

Establishing environmental performance objectives in the preliminary stage to support the procurement process

Putting together the team in the preliminary stages

Early assumptions about LCC



Specifying the brief and performance requirements:

a) **Under conventional contracting arrangements (D and B)**

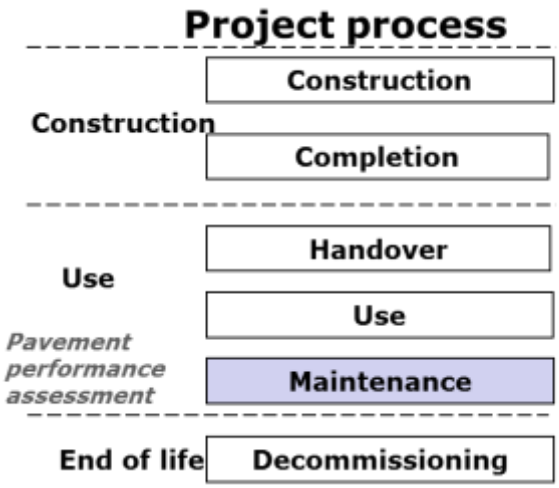
A design is procured and then a contractor. The brief forms part of the ITT

b) **Under DB, DBO arrangements**

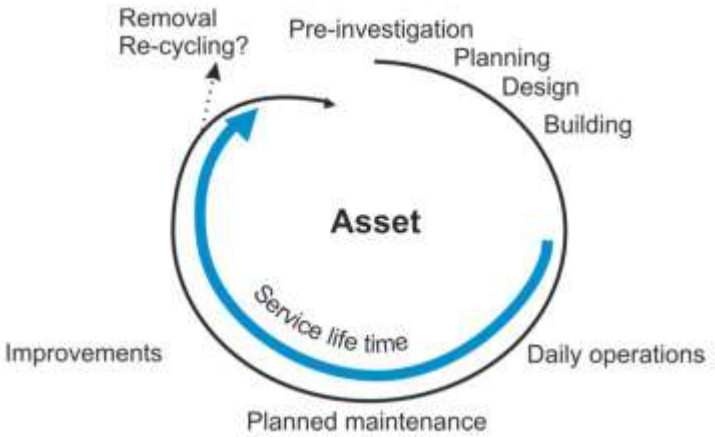
The contracting authority performance requirements will form the basis for the ITT and the GPP criteria have to be fully addressed ⇨ it may be necessary to procure external expertise

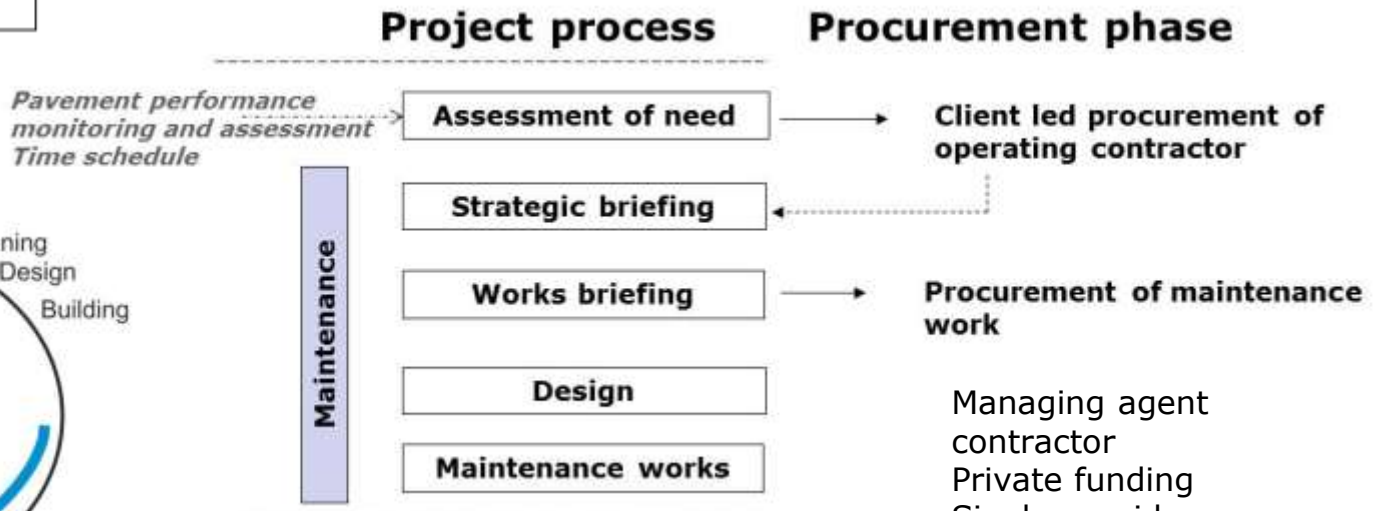
Putting the team together (reform of the public procurement Directive **art. 66** explicitly stated that the organization, qualification and experience of staff assigned to performing the contract can be a criterion for **awarding a contract**

Commencing the detailed design Technical tools used by design team to meet GPP requirements will include LCA



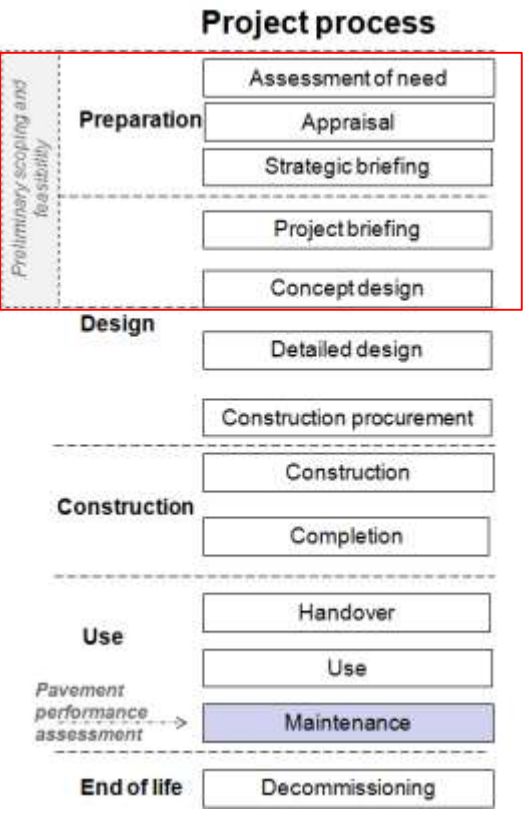
In D-B-O contracts LCC becomes an important consideration because the contractor will seek to minimize running costs





Managing agent
contractor
Private funding
Single provider
Multiple provider
Framework
Joint venture
In-house

Road asset management



Preliminary scoping and feasibility

Rolling resistance: evaluation of the expected traffic flow expected in the road

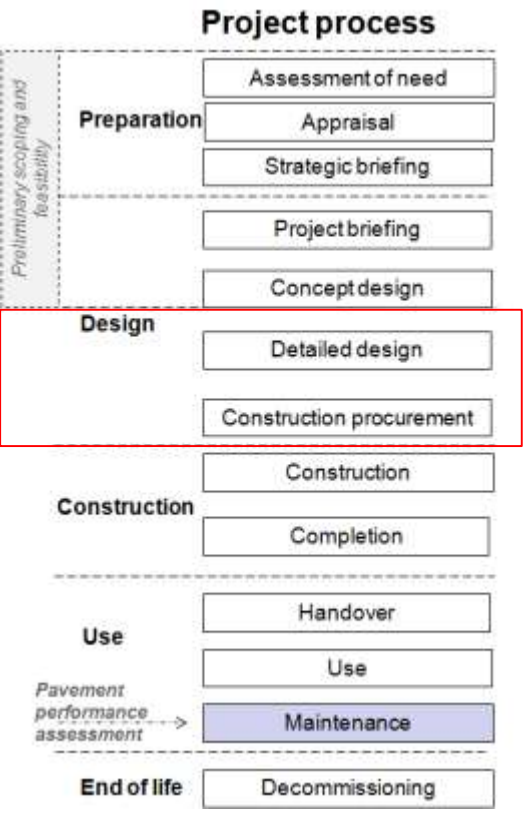
Congestion: comparison of road capacity design with modelling of future traffic flow (considering land-use planning future demographic scenarios)

Resource efficient construction

Soils: ECI

Recycled/secondary aggregates and by-products: PA strategic objectives and policy on waste minimization (SSM Sustainable Supply Mix)

Transportation: ECI (Australian case study in which ECI helped achieve savings in fuel consumption of 60% by optimizing the mass haul)



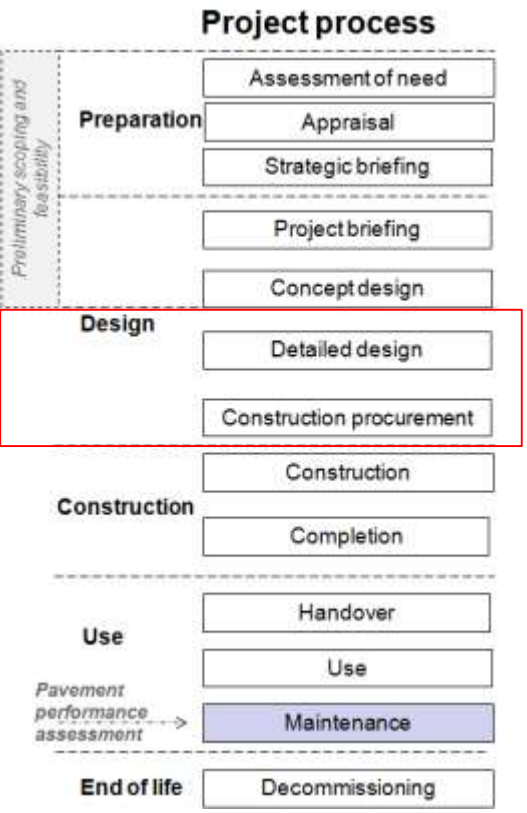
Detailed design and performance requirements

Rolling resistance: requirements for surface roughness and surface texture of materials and their expected service life. Maintenance and rehabilitation (M&R) strategy plan. New more durable materials, new technologies and best available maintenance strategies should be identified while updating the plan

Congestion: preliminary traffic congestion mitigation plan

Drainage: one or more drainage system option complying with the requirement via hydraulic modelling. Technical drawings will clearly demonstrate connection to main sewers

Noise: any noise barriers included in technical plans for site. Calculations predicting acoustic performance



Detailed design and performance requirements

Resource efficient construction

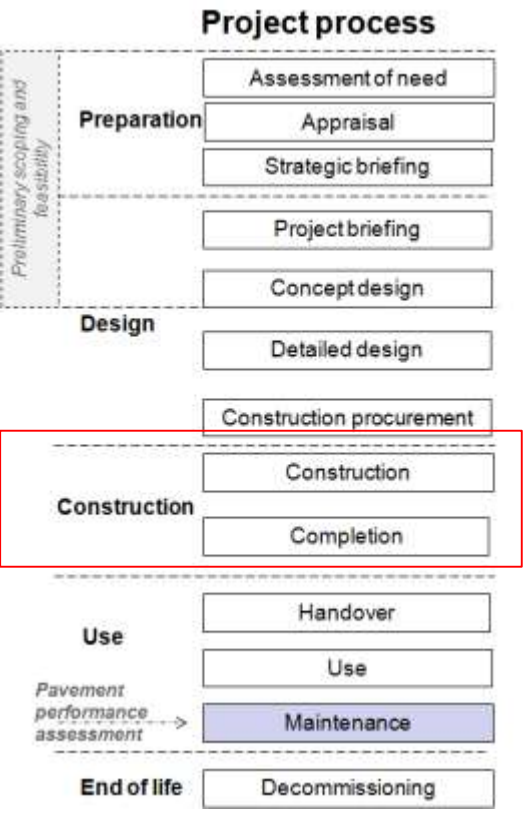
Asphalt: specification of the use of WMA, the mixing temperature and % of RAP, both for construction and maintenance

Concrete: specification of type of cement, required strength class and other technical criteria

Soils: quantification of the maximum amount of re-used soils within the soil management plan and the management activities on the reserves of topsoil and subsoil

Recycled/secondary aggregates and by-products: *q*uantification of the proportional contribution of the recycled content to the overall value of the road infrastructure.

Transportation: inclusion of a specific requirement for the mass haul table



Construction

Rolling resistance: verification of surface roughness and texture

Resource efficient construction

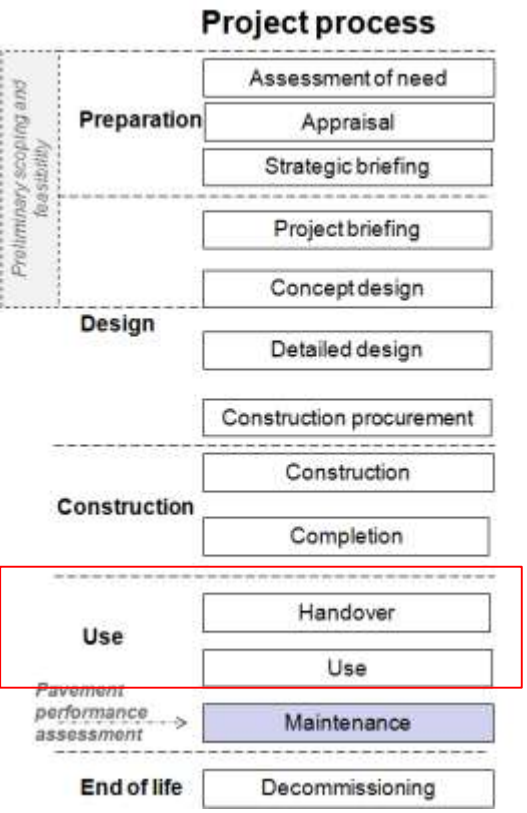
Asphalt: assessment of test mixtures. Re-use of any asphalt waste and recording of quantities

Soils: conformance to the soil management plan via site inspections

Recycled/secondary aggregates and by-products: recording quantities of total and of recycled/secondary aggregates. Contract clauses for the verification of the incorporation of the recycled content

Drainage: Constructor should demonstrate to the client by site inspections that the drainage system match the plan

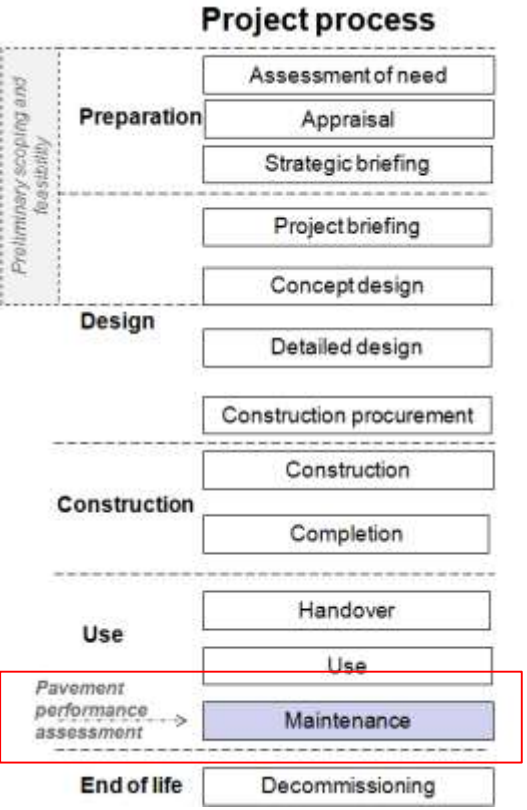
Noise: presentation of open porosity data for test mixtures. Prior to road opening, carrying out any comprehensive criteria testing for noise emission by SPB and CPX methods or macrotexture measurement



Use

Rolling resistance: pavement performance assessment and monitoring and verification of surface roughness and texture

Noise: in-situ performance of noise barriers will be assessed at regular intervals as specified in the contract. Optional further monitoring of noise emissions



Maintenance

Rolling resistance: activities realised according to the M&R strategy plan, taking into account the target values for IRI and MPD set in the detailed design

Congestion: specific contract clauses related to planned maintenance commitments

Resource efficient construction

Asphalt: re-use of any waste asphalt onsite. Any asphalt taken from site shall be recorded and sent to an off-site asphalt plant for re-use

Conclusions

GPP criteria	Scenario where GPP criteria has little or no beneficial impact	Scenario where GPP criteria can have a potentially large beneficial impact
Rolling resistance		
Roughness (IRI)	Smooth pavements with low vehicle traffic	Rough pavements with high vehicle traffic
Macrotexture	High stiffness pavement structures on low traffic section. Low heavy traffic	Low stiffness pavement structures on high traffic sections. High heavy traffic
Congestion	Pavement sections with low traffic or where capacity is much higher than demand. Sections with readily available detours. Use of lane closures during off-peak traffic periods	Pavement sections with high traffic or where capacity is comparable to demand. Sections where detours are not readily available. Lane closures occur during peak traffic periods
Materials	Pavements with low structural demands (e.g., low AADTT, temperate climate) that require less material. Use of recycled or other low-impact materials. High quality construction practices that facilitate longer service lives.	Pavements with high structural demands (e.g., high AADTT, extreme climate) that require more material. Use of virgin materials. Low quality construction practices that decrease pavement service lives.
Transportation	Low overall material demand. Locally available materials, especially aggregates. Use of in situ recycling strategies. Any long-distance travel utilizes efficient transportation modes (i.e. by train)	High overall material demand. Materials need to be shipped over long distances, especially aggregates. Long-distance travel using inefficient modes. Use of virgin materials for each process.
Noise – low noise pavement	Roads remote from populated areas. In low traffic roads. In low speed limit roads (<50km/h).	In medium-high speed roads (>50km/h) of freely flowing traffic.
Noise barriers	In areas with limited available space. Roads with low speed limits. Roads remote from populated areas.	In rural areas near villages. Roads with medium-high speed limits. Roads with high surface roughness.
Drainage -flooding	In arid areas with no previous history of flooding.	In river basins with identified flood risks. In areas with high urban development.
Drainage - water pollution	In arid areas with little rainfall. In areas remote from sensitive water bodies. In low traffic flow roads.	In areas near sensitive water bodies. In high traffic flow roads.

	Rolling resistance	Congestion	Construction materials	Soils	Materials Transportation	LCA	Drainage - flooding	Drainage water pollution	Noise – low noise pavements	Noise barriers
Low traffic flow										
High traffic flow										
Freely flowing										
Not freely flowing										
Low speed road (<50km/h)										
Medium-high speed road (>50km/h)										
Rural road near populated area										
Rural road remote from populated area										
Urban road										
Within river catchment with known flooding risk										
Within arid area with no previous flooding risk										
Road area with unsuitable subgrade soil										

Questions on the sequence of procurement activities

- Is the indicative **sequence of procurement activities** well described?
- Do you think that the described **type of procurement models** could be **applied** usually to the common infrastructure projects?
- Are the **process stages** well identified?
- Do you think that the described type of **procurement models for maintenance activities** could be applied usually to the common maintenance and rehabilitation projects?

Questions on procurement process for

1. rolling resistance

- Do you think that the **tender could include specific values performance requirement for surface roughness and texture**? Both immediately after construction for verification of conformity and as trigger values for subsequent maintenance tasks?
- **Would it be feasible to include a M&R strategies plan** in the detailed design and using it as a baseline plan?

2. congestion

Does the construction company usually assume responsibility for maintenance? Are **maintenance activities fixed** in the contract regardless of road condition or is the contractor required to maintain the road surface in suitable condition?

3. soils

Do you have any experience with a **soil management plan in construction projects**?

Thank you

1st Ad Hoc Working Group Meeting for the revision of the Green Public Procurement criteria

12th March 2014

Next steps and closure

Today

Product Group Identification (GPP AG)

Preparatory work

Preliminary Report

1st AHWG

Translate criteria areas into criteria

2nd AHWG

Technical report (draft criteria areas and guidance on procurement) 1

Technical report (draft criteria and guidance on procurement) 2

Final Draft Criteria

Next steps

1. **Minutes** of the meeting will be sent in the coming weeks

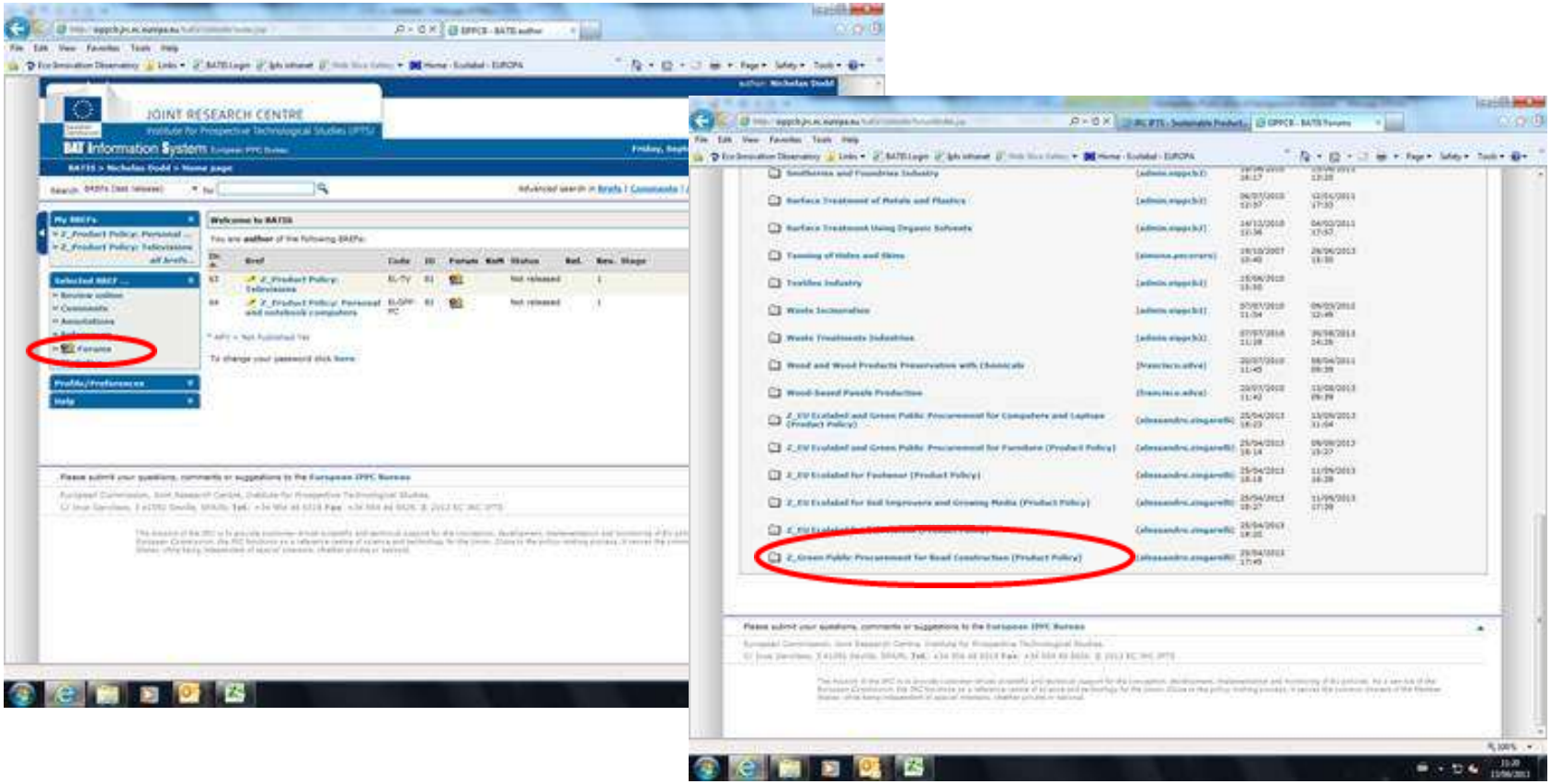
2. Stakeholders can provide comments on working document until **April 30th** 2014

3. Comments need to be transmitted in BATIS

4. Draft criteria proposals will be prepared and published about 4 weeks ahead of the second AHWG

5. Second AHWG will take place in **end 2014** in Brussels

Using the BATIS system



Thanks for your attention

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