International Conference on Contemporary Architecture in Historic Settings.
UNESCO Recommendation on historic urban landscapes.
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- ON A METHOD FOR INDICATOR BASED MONITORING OF VISUAL INTEGRITY. -

"Incompatible new development". Bandarin [1].

Content.

> *"A **sightline**, **sight line** or **visual axis**, is a normally unobstructed line-of-sight between an intended observer (or spectator) and a stage, arena, or monument, for example. Sightlines are a particularly important consideration in theatre and stadium design, road junction layout and urban planning. In cities such as London, construction within sightlines is restricted to protect the key views of famous landmarks.[1] Objects that have a direct line of sight with one another are said to be **intervisible**."* http://en.wikipedia.org/wiki/Sightline

[1] A new international instrument: the proposed UNESCO Recommendation for the Conservation of Historic Urban Landscapes . Francesco Bandarin 2011
http://www.bbsr.bund.de/nn_23470/BBSR/EN/Publications/IzR/2011/Download/DL__Bandarin,templateId=raw,property=publicationFile.pdf/DL_Bandarin.pdf

1. Introduction and delimitation of the subject.

To cope with the challenges related to the visual integrity of monuments and historic ensembles has a long development history. In the revised OUV for Røros mining town from 2009 visual aspects that are monitored. The OUV includes very general formulations of attributes connected to visual sight lines and visual landscape qualities, but no specific indicator for visual integrity as such.

Today the inclusion of visual aspect attributes of a site has become mandatory in the OUV. To cope with this inclusion a management tool is needed to be developvisual integrity indicators and this is considered difficult.

While the area should be clearly delimitated by border(line)s, thelandscape has no limits, or its limits are ambulant: they follow the gaze of the observer.(Historic Urban Landscape ± A Conceptual Analysis by Gábor Sonkoly)

The adoption in 2011 of the UNESCO's General Conference Recommendation on the Historic Urban Landscape intends to become a "soft-law" to be implemented by Member States on a voluntary basis. Its objective is to facilitate implementation through formulation and adoption of supporting policies[2].

This paper will outline central elements in such a management (and monitoring) system and outline a method for developing indicators to monitor visualintegrity.

The Nordic experience.

The Nordic experience with monitoring specific sigh-lines is limited.The Nordic experience is a need for such management tools. We also experience protection of sight lines as a growing challenge and we wish for 'objective'instruments to handle the visual aspects of historic integrity.We can say that the Nordic countries are working with the subject but have not arrived at a unified 'method'.

The Nordic countries have come far in integrating cultural heritage in the urban planning processes. The heritage, including (important) sight-lines are considered at par with other parameters of a modern planning process. Heritage interests are alsointegrated in the mapping tools used by the local administrations. One reason why (built) heritage has such a strong position in the planning process in Norway is that (immovable) heritage is the responsibility of the Ministry of Environment. Environmental political administration works on the principle that each sector has an independent environmental

[2] http://whc.unesco.org/en/activities/638

responsibility. Environment questions are of a cross sectorial nature and therefore each sector Ministry is responsible for the immovable heritage that lies within their area of responsibility.

The sight linesbetween the medievalOslo and the forteress. From Verdens Gang.

Sight-lines, view-lines etc. and their preservation are accepted parameters in planning processes when developments remove or deteriorate historic important sigh-lines etc.

The preservation of historic sight-lines is critical in a major and on-going planning issue in the capital Oslo. The conflict involves the upkeep of the sight lines from the mediaeval Oslo to the Akershus fortress and vice versa. The new, (but protected) Opera house, a planned new Edvard Munch museumtogether with a major urban housing development project, together threatening to break the historically important sightlines between the mediaeval town and the mediaeval fortress. The heritage authorities are fighting to retain the sight lines while the policy responsible of the town council is willing to 'sacrifice' the sight-lines for more built sq. meters buildings.

But of course, also in Norway, there is fierce debate, where property developers, local politicians and heritage authorities disagree on how much value and emphasis should be gives to such considerations. In the case of a WHS such sigh-line considerations that derive from the OUV would be given absolute priority insofar as they carry the attributes of the WHS and therefore enjoy absolute protection.

2. The most recent developments to consider.

The work with development of a Historic Urban Landscape (HUL) management system has led to the mandatory inclusions of attributes of visual integrity is progressing in the OUV[3]. An expert meeting on the topic was called in March 2013, in Agra in India[4]and delivered guidance for developments that we need to consider.

TheState parties are encouraged to consider integrity and authenticity of the visual qualities of the attributes and the relationships of the management of existing world heritage sites (art. 16). They recommend a holistic view while in dealing with visual impacts and qualities (art. 17).

The OUV (**Outstanding Universal Values) is a central starting point for** monitoring tools for the identification and protection of key views, viewpoints and panoramas and silhouettes. These should be included in the management systems and nominations, and should **derive from the Outstanding Universal values of each property**(art. 18).

The impact assessment is an **important tool** to avoid adverse visual impacts on the Outstanding Universal Value of each property (art. 19). The tools for **assessment of visual qualities and impacts should be integrated in the planning process** (art. 20). And a mandatory assessment of Development proposals for negative visual impacts through damage to key views, viewpoints, panoramas and silhouettes should be part of the legal system of the state party (art. 20). Practitioners are asked to share, **to identify best and efficient practice available** in visual impact assessment (art. 21).

The WHC Operational Guidelines should be revised to include:

> *"Identify the attributes that carry those values… attributes clearly stated. ….limits and rules should be included in the management system of the property to ensure the protection of the attributes of the OUV, and monitoring should take place …" (art. 27).*
> http://whc.unesco.org/uploads/events/documents/event-992-18.pdf

[3]Recommendation on the Historic Urban Landscape (10 November 2011 UNESCO's General Conference).
[4]Agra Expert meeting on Visual Integrity, March 6-9 March 2013.
http://whc.unesco.org/uploads/events/documents/event-992-18.pdf.

3.OUV, 'Management System Tools' and HUL management system.

A method for developing operational condition indicators (for monitoring) based on the site OUV has been tested[5] by ICOMOS. The primary objective of such a system is the "*preservation / conservation*". The OUV is an administrative tool and the starting point to derive operational variables for monitoring. The development of the OUV is of critical importance.

There are a number of approaches to develop the OUV. The Norwegian administration analyse the historic attributes of a settlement using is the DIVE method[6].

"It [DIVE] emphasizes the conservation of the physical and spatial aspects within the development / transformation process of the city, while seeking sustainable development by transforming the cultural values of the city into assets that add value to all dimensions of the development processeconomic, political, social, cultural, environmental and spatial)."

The OUV is a specification of requirements for inscription to facilitate the administrative conditions (including monitoring and reporting). It is, for this reason, important to '*write the visual aspects into the OUV*'. Only in this manner can the visual aspects be incorporated into the development of monitoring indicators.

The monitoring should focus on the condition (state of conservation) of OUV attributes. The variables monitored are (operational) attributes and what is monitored for each object / site is its (physical) condition. The OUV attributes, their features and elements are the basis for selecting variables. A selected number of these variables or groupings (aggregates) of variables constitute the indicators to monitor.

The incorporation of such visual integrityindicators in the administrative legal planning processes is critical for its implementation and operational use. A case:

> *State of Conservation (SOC). Seventeenth-century canal ring area of Amsterdam inside the Singelgracht (2011).* In Amsterdam "*High-rise construction in Amsterdam"* was scheduled for adoption by the Amsterdam Council on 16 February 2011.*January 2010 the Municipal Executive decided to add a special guideline on high-rises. In Amsterdam a High-Rise Impact Report is now compulsory for building initiatives above 30 metres in height. This is mandatory in the World Heritage Site and its buffer zone, in a 2km extra*

[5] *"A Methodological Approach to Monitoring of WH Sites Based on OUV of Røros Mining Town and the Circumference."* In Outstanding Universal Value and Monitoring of World Heritage Properties. Ed. Prof. Boguslaw Smygin,. Published by: Polish National Committee of ICOMOS and National Heritage Board of Poland, Warsaw 2011. ISBN 978-83931656-3-6.

[6] Dive as a tool. ISBN: 978-82-7574-057-9 (pdf). This English pdf edition is a shortened version of the Norwegian printed publication: *Kulturhistorisk stedsanalyse: En Veileder i bruk av DIVE*, ISBN 978-82-7574-047-0. Web based pdf, ISBN 978-82-7574-404-5. (Reference. Urban Heritage Analysis)

buffer zone outside the Singelgracht, and in the National and Municipal Protected Cityscapes under consideration outside the city centre[7].

A monitoring system should be kept simple and costs reasonable. It should contain effective methods keep track of the selected indicators through standardised methods / procedures and computer assistance. It is essential for the effect of such management tools that they are integrated in the legal planning processes. New technologies and new media (satellite technology, sensors, computer assisted monitoring, integrated maps, etc.) have an important role and are essential for such integration.

The standardisationaspect is essential to secure compatible and comparable monitoring data input. A dedicated visual-integrity standard could guide monitoring. Just as the CEN EN 16096:2012 'Conservation of cultural property – Condition survey and report of built cultural heritage', guides the classification of maintenance condition of the built heritage. Standards are also important as they can prescribe a procedure to operationalize variables.

4. A Method

The methodology is a 'hierarchical' model of how the central descriptor terms are inter-connected. Component, Feature and Element are descriptor terms ordered in a hierarchy. The monitoring should focus on the condition (state of conservation) of OUV factors. The variables monitored are (operational) attributes. What is monitored for each object / site is its '(physical) condition'.

The system[8] is characterises the heritage values of the site by the following operational documentation:

1. OUV (with WH criteria)
2. material carriers of these value attributes
3. indicators that enable control of the state of these values and carriers

A monitoring system has defined indicators, procedures and an assigned organisational responsibility for the execution and reporting obligations for the state of the indicators. The system is based on a given relation between the descriptors: Attributes, Component, Feature and Element.

1. From the **Criteria** for nomination and their relevancy for the site emerges a set of attributes.
2. The **Attributes** are the most encompassing and widest descriptors differentiating the qualities of the site.
3. For each attribute a set of **Components** serve to describe important aspects or parts of the attribute.
4. For each component a set of **Features and Elements** describe and define its qualities.The features and Elements are the lowest level descriptor variables used.

[7] http://whc.unesco.org/en/soc/420
[8] BOGUSŁAW SZMYGIN[8] ICOMOS POLAND

Figure 1. The structure and relationship between descriptive terms used in the document.

OUV –→ Attribute --→ Component --→ Feature/Element.

The descriptor terms are variables that define the main elements of a site and permit the analysis of the (outstanding) qualities of this site. From a monitoring point of this method allows the selected monitoring variables to be more clearly connected to the attribute(s) they monitor, ref. to the tables.

An additional consideration is that the administrative nature of OUV and the resulting monitoring system should emphasise to monitor (only) the most important and most threatened attributes of the site. A monitoring system must also be a cost effective management mechanism. Operational responsibility must be clearly delegated.

Examples are drawn from the Røros OUV with the description of attributes, components, elements and features aredrawn the nomination paper of 2009[9].

Table 1. Attributes.

Attribute	
A.1.	Reflects the particular kind of industrial planning introduced by the Danish kings of Norway in the sixteenth and seventeenth centuries.
A.2.	Characteristic example of this type of technological and industrial development,
A.3.	A regular urban pattern adapted to the mountain terrain.
A.4.	The totality of the urban complex and it's individual constituent parts.
A.5.	The industrial buildings and the slagheaps created over the years.

[9] Røros Mining Town and the Circumference. Norwegian nomination 2009 for extension of WHS Røros Mining Town. Norwegian Ministry of Environment. Oslo January 2009.

Note: In total there are 16 attributes declined from the OUV.

The next step is to identify the components and their Feature or Element. The Feature or Element is, in this method, the lowest level identifiable information carrier. But Feature or Elementalso contains the highest precision level information.

Table 2. From attribute to Feature and Element.

→ Attribute --→ Component --→ Feature/Element .

Attribute	Component	Feature / Element
A.5 Totality of the urban complex constituent parts.	C.1 - 2.1 The landscape C.2- 2.2 Røros Mining Town C.3 - 2.3 The Smelting House : Malmplassen square C.4 - 2.4 The Slagheaps C.5 - 2.5 The Church C.6 Flanderborg, C.7 Åsengården farm ** second number indicates the provenance chapter of the component	C.2 F.1 - 2.1.1The town plan 1711 C.2 F.2 - 2.2.1 Bergmannsgata street C.3 F.3 - 2.3.1 and it still functions as a center of activity and as a meeting-place C.1 F.4 - 2.4.1 **into major features of the landscape. appear almost as they did during the time when the copper works were in operation.** C.4 C.5 F.5 - 2.5. with 2.4 Together they dominate the townscape. C.5 F.6 Impressive edifice, with lime-washed masonry walls in late-Baroque style. visible from the entire town F.7 Flanderborg, more organic structure, lower classes F.8 The outbuildings and the farm Åsengård. ** second number indicates the provenance chapter of the descriptor.

The features and elements are variables and their condition may therefore vary over time. This variation reflects the general maintenance level of the site and indicate, whether or not, there has been or not any degradation in the condition over time.

5. The Indicators.

So far we have concentrated on developing information variables (features and elements) and the total number of such variables will be high for any substantial site. From these variables we must therefore select a limited number of high value information variables as indicators for 'a manageable' monitoring system. It is also possible, sometimes necessary, to construct new information variables by aggregating variables.

The selected indicators are critical and must capture the essential elements of the site. These information variables are symptomaticof the general condition. The indicators can vary over time and a degradation of condition take place. The indicators are high value information variables and they are indicative of a more general condition. Some would say that indicators are symptomatic information. Monitoring should define approaches and **actions to** appreciate and **measure**decay, loss of significance or trivialisation. Monitoring is the basis toprevent or remedysuch loss. UNESCO also wishes that the monitoring results inand proposes improvement in conservation, management and interpretation practices. I personally think the last element is not a part of monitoring, but a follow up of monitoring results.

Picture. Important sight line (Røros) with a possible high rise.

Indicators for "*Identity and visual integrity*" must be developed. Such indicators of visual integrity will now be proposed attributes in the 'Recommendations on HUL'. Amonitoring management also includes: operational objectives, a unified (standardized) methodology, (objective and operational) indicators, specifications of quantifiable units (what and how to measure), tolerance levels, mandatory consultations (communication / reporting) and 'decision-making 'triggers'' (defined actions and implementation procedures) and frequencies.

> *Qualitative and quantifiable indicators should be developed to assess the contribution of the setting to the significance of a heritage structure, site or area. Indicators for monitoring should cover physical aspects such*

as intrusion on views, skylines or open spaces, air pollution, sound pollution, as well as economic, social and cultural dimensions[10].

The Indicators for "*Identity and visual integrity*" are not especially difficult to arrive at as indicative variables.There is some work with defining the unit to monitor and the scale of measurement. This can sometimes be challenging. To be effective these indicators need to be inserted into the public planning process to become effective tools to avert deterioration of visual integrity. This is a regulatory challenge.

After identifying or constructing meaningful indicators these need to be go through a procedure to secure their operationalization, to create standard scoring or measurement procedures for statistical quantification. In this procedure it is important to specify the different measures to be reported. For example; total sq. meters or number of buildings / objects? Or do we opt for a grading scale like inCEN EN 16096:2012 Conservation of cultural property – Condition survey and report of built cultural heritage? Or do we use a dichotomy such as 'change' or 'no change'? Such considerations are outside the scope of this paper and are relevant for all indicators. Decisions need to be made and a set CEN Standard for the procedure would be an advantage.

In developing visual indicators new technologies will be essential. The use of GIS, (aerial and other) photography with digital processing, visualisation technology and computer assisted change identification are examples of useful technologies. In monitoring the Røros WHS the NDCH uses aerial photography.We also use satellites for urban development monitoring at the national level.

Table 3. Some visual integrity relevant indicators monitored in Røros.

-→ What to measure / monitor with comment. -→ Interval → Responsible instance.

Monitoring indicator	Comment.	Freq.	Responsible
1. Overgrowth of cultural landscapes:	**Monitored through the analysis of aerial photographs.** Comment: Should also be expressed as a %-tage increase in overgrowth relative to total area. Only visual assessment of change with no indication of a figure is not operational for time series. Need for further refinement.	Yr.	County, DCH
10.Construction of holiday homes	**Monitored through the analysis of aerial photographs.** Comment: Increase in absolute n. of such buildings in the area monitored. Should also be expressed as a %-tage increase in numbers relative to n. at the start of the monitoring programme.	Yr.	County DCH
11.Growth of urban settlements:	**Monitored through the analysis of aerial photographs.** Comment: Should be expressed as a number and as %-tage increase in the extended area relative to the historic area. Need for further	Yr.	County DCH

[10]XI'AN DECLARATION. ON THE CONSERVATION OF THE SETTING OF HERITAGE STRUCTURES, SITES AND AREAS. Adopted in Xi'an, China. by the 15th General Assembly of ICOMOS on 21 October 2005. Final version - 22.10.2005. http://www.icomos.org/charters/xian-declaration.pdf

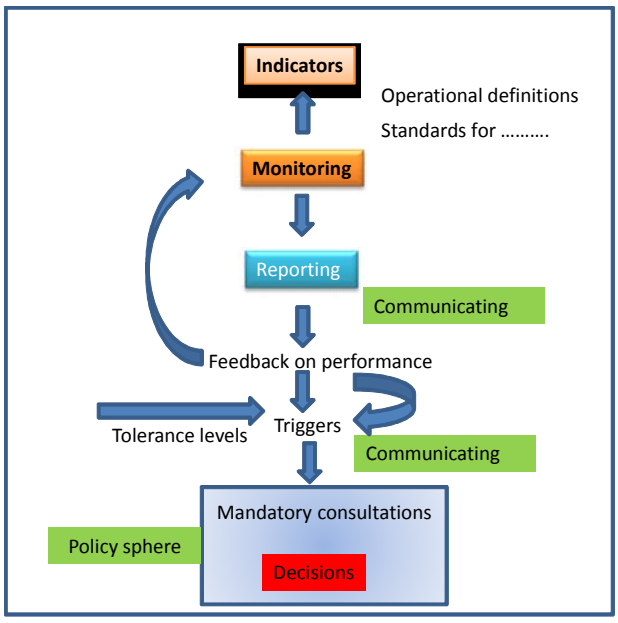
	refinement.		
12 Visitors and visitor damage.	**Use of NS 3423 or CEN/TC 346 prEN 16096 with addition of specific measurements / visual inspections done at defined locations**. Comment: Visitor numbers should be included. Locations and parameters need to be defined. Need for further refinement.	2 *	Yearly in course of season. ?

6. The monitoring, standardisation, regulations.

A monitoring systemthat delivers relevant comparable data demands some sort of standardisation. A(formal) standard is a set of procedures to assure a shared methodological approach for the tasks at hand; i.e. the given objective(s). In CH management the use of the Standardisation Institute is new but increasing in use.

The use of standards is illustrated through in the CEN TC 346 "Standardisation on Cultural Heritage" work.Especially the CEN EN 16096:2012 Conservation of cultural property – Condition survey and report of built cultural heritage is a standard that has become widely used only after a couple of years existence.

Technology can rationalize Monitoring systems and reduce costs.



Even more important is the integration on the regulatory side. Monitoring sight lines is of little use if the visual effects are not made mandatory considerations in official administration planning processes.Integration of cultural heritage in general planning processes is now a UNESCO recommended policy for Member States.

A Monitoring system should include, or be part of, a larger decision support system that also 'triggers' and regulates the consultations between the parties in view of rectifying any deteriorations of the attributes of the site.

Making use of the (EU) EIA regulations (Environmental Impact Assessment) are specifically mentioned as important in preparatory Recommendation work[11]. The regulation is under revision and this work can illustrate how to strengthen the cultural heritage aspect.

[11]P. 10 Recommendations for HUL. First draft in A New international Instrument: the proposed UNESCO Recommendation on the Historic Urban Landscape (HUL). Preliminary report. UNESCO

Energy efficiency regulations are a second illustration of direct effect of EU legislations on CH management (while it should not).

Public heritage authorities will need increasingly to engage with the trans-national production of regulations in the EU and beyond, as these supersede national regulations and affect CH management capacity.

7. Summarising.

The policy demands are increasing for more mainstreaming of heritage policies (to increase safeguarding efficiency).

> "*Member States should integrate urban heritage conservation strategies unto national development policies and agendas (following HUL) approach).* (…) *Planning and regulating tools are not always adequate*[12] (…). The EIA regulations are specifically mentioned in "The Tools 11" mention EIA to support "sustainability and continuity in planning and design." [13] as urban development regulationsare in focus.

Visual integrity is a specific attribute. These visual and spatial qualities should now be formulated in the OUV as attributes. The OUV is the basis for developing information variables for the site and from these selecting or constructingthe most indicative information variables for a monitoring system. There is a methodology for thisvariable development based on the OUV attributes.Visual indicators and other spatial attribute indicatorsnow need to be set and included in monitoring reports.

Visual integrity indicators are no different from other indicators, through their operationalization and measurements are. It is basically a question of using the described OUV based method and operationalizing critical variables as indicators. To develop operational visual indicators needs the use of the same techniques to become measurable and quantifiable as other indicators. It is primarily a question of knowing what to do. There is expertise in this field to draw on.

Modern technology offers great opportunities for rational use of monitoring, also of visual integrity. The use of any digital computer assisted monitoring, mapping and digital change identification (of for example photographs) allows advanced monitoring at reasonable costs. The precondition is of course a well-designed (and standardised) monitoring of operational indicators.

A set of Standards for developing such indicators would assist in the development of comparable quality data enhancing the monitoring through 'Benchmarking'. This could be initiated through on going CEN TC 346 Standardisation of Cultural Heritage and could, on the building side, incorporate existingCEN EN 16096:2012 Condition Survey.

Heritage need to engage more pro-actively with and implement such regulations. The heritage strengthening of the EIA EU Directive was achieved through active cultural heritage player involvement in the regulatory process.

[12]The New international instrument
[13]P. 10 Recommendations for HUL. First draft in A New international Instrument: the proposed UNESCO Recommendation on the Historic Urban Landscape (HUL). Preliminary report. UNESCO

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