



TUC RAIL

Consulate General of Belgium
The Hon. Geert Criel
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United States of America

your reference

our reference
E-AME-OC/BLD/cdn/20110218

Brussels
February 18th 2011

Subject: Agriculture and high-speed rail: questions of CAHSRA

Dear Consul General,
Dear Mr. Criel,

We acknowledge receipt of your e-mail dated January 17th 2011 in which you transmitted some questions from CASHRA's CEO, Mr. Roelof Van Ark, on agriculture and high-speed rail.

After carefully having examined these questions, we can provide you the following preliminary information:

1) Statistical data/experience on the effects of the implementation of High-Speed Rail in agricultural areas

TUC RAIL has a lot of experience with integrating high-speed rail infrastructure in the environment, including agricultural areas.

During the design stage of the entire Belgian high speed railway network TUC RAIL has realized all necessary technical (feasibility) studies in the field of landscape integration and optimum track alignment in order to insure minimum nuisances such as noise, vibration, real estate take, visual impact, barrier effect...

Based on the results of the environmental impact analyses, considerations were made as it comes to environmental and agricultural issues. Throughout hearings with local governments, interest groupings, farmers, inhabitants,... and with the approval of the client, the most appropriate solutions were developed and realized.

As the Belgian high-speed railway network has been completed and is operational for several years now, TUC RAIL can not only rely on past experience and statistical engineering data but also on feedback from operations.

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Since the influence of high-speed rail on livestock has not been considered as an issue – not by the decision makers nor by the farmers – TUC RAIL does not possess statistical data on this topic. However, we would like to point out some important considerations that supports the idea of a high-speed railway system not having a significant negative impact on the environment :

- Electrical high-speed trains do not produce CO₂-gasses and hence are not detrimental to agriculture, men and nature;
- By using long welded rails, landscape integrated noise barriers such as green walls, anti-vibration devices such as sub-ballast mats and mass spring systems, ... noise and vibration are kept to a minimum. Compared to highways and conventional diesel train corridors, an electrified high-speed rail corridor generates far less noise and vibrations;
- Creative solutions such as ecoducts (i.e. wildlife passages over the high-speed railway lines) and custom-made under- and overpasses especially built for farming equipment help minimizing the impact of the high-speed railway lines on the environment (e.g. reduction of the barrier effect);
- Since the first high-speed rail section in Belgium was completed in 1997 – i.e. the crossborder high speed section from France to the entrance of Brussels (capital of Belgium and Europe) – up to now, no complaints and/or problems regarding nuisance to agriculture, livestock, inhabitants,... were recorded. With the completion of the entire Belgian high-speed railway network in 2009, TUC RAIL successfully integrated a high speed rail infrastructure in one of the most densely populated areas and busiest rail infrastructures as well as in the important agricultural areas without causing any negative effects so far.

2) Responses to the questions raised in the email of Mr. Van Ark

a) Regarding the effect that high-speed trains could have on bee colonies, we are unable to provide you with any research data. We refer to the general comments made under point 1. However, we would like to point out that within the real estate take where the high-speed railway is being realized no plants or vegetation are foreseen/allowed. This should diminish the attraction of bees to the HSR corridor.

*Even
minimum
de Ecoducten*

b) Restrictions on aerial crop spraying of insecticides due to the proximity of high-speed rail passengers:

Since high-speed rail transportation needs sealed trains in order to avoid hear nuisance when running through small diameter tunnels, possible restrictions on aerial crop spraying will be more of a technical kind than due to the proximity of high-speed rail passengers.

*Use
of carbon
filtration
from the
by train*

c) Distance from the track that enables farming to continue productively:

In Belgium the real estate take calculated by TUC RAIL has proven to be sufficient to allow farming to continue productively.

In more sensitive areas TUC RAIL considers additional solutions such as strong and high fences that serve as protection as well as noise barrier to separate the track from the agricultural lands, anti-vibration devices, ecoducts, the use of cut-and-cover tunnels... that contribute to the continuity of farming nearby the high-speed line.

d) Width of the real estate take when a two track HS rail system is built through agricultural lands:

The width of the real estate take varies in function of the alignment and the type of the track that is being built.

When choosing the optimum right of way, some of the parameters taken into account are:

- HSR corridor distance and intermediary stations
- Environmental parameters (soil conditions...)
- Minimal nuisance to inhabitants and nature (noise, vibration, visibility...)
- Maximum use of existing linear infrastructure to align with
- Estimated construction costs taking into account the type and number of artworks needed (tunnels, bridges, viaducts...)
- Avoidance of rendering parcels inaccessible
- ...

All these and other parameters will lead to an optimum right of way and hence also to a type of track (e.g. with or without embankments, in cut-and-cover...). The width of the real estate take will then for example be larger when there are embankments, a lot of cant, ...

Every situation has to be examined taking into account its specific parameters and constraints. During the construction of the Belgian high-speed railway network and through other major railway projects in the densely populated areas around and in Brussels, TUC RAIL has developed several creative solutions to minimize the real estate take, taking into account all constraints related to the existing location where the new tracks were to be realized.

To give an idea on a normal width of real estate take, one could calculate as follows:

- Distance between the tracks = 4.007 meters
- Width of the tracks = 2 x 1.5 meters
- Additional distance for sleepers, ballast... = 2 x 1 meter
- Extra real estate take width for safety, fences,... = 3 meters

The minimal width of a two track HS rail system is about 12 meters or 39ft.

e) Effects of the wind from high-speed trains passing by crops in blossom on their pollination:

Wind effects from high-speed trains passing by are neglectable due to their aerodynamic shape. In point d) we have given an example of the width of the real estate take for a two track HS rail system being about 39ft. Within this real estate take there is a service path which can be used by qualified personnel to carry out works even when high-speed trains are passing by. This proves that the wind effect generated by high-speed trains is so low that the safety of nearby workers can be assured. Hence the wind effect from the HS trains on the crops situated outside the protected corridor (after the fences) will be far less important than the prevailing wind itself.

*Important
 view with
 future set up
 for maintenance*

f) Experience on correcting irrigation systems when high-speed train systems are built through farm lands:

In Belgium only a few corrections were to be made since the alignment used as many existing linear infrastructures (e.g. highways) as possible. The other agricultural lands that were crossed by the high-speed rail corridor did not have these kind of irrigation systems.

In case such optimum alignment can't be found and some agricultural lands using irrigation systems have to be crossed, these irrigation systems could be subject to corrections. It is then

up to the engineering companies to look for solution that minimizes the impact on the irrigation system.

g) Effects of noise and vibrations of high-speed trains on milk production of dairy cows:

Although this question has been raised more than once throughout history of railways (e.g. inauguration first train in Belgium/continental Europe in 1835), there's not a lot of statistical data available to answer this question since no complaints were recorded.

Some studies have concluded that noise and vibration generated by farming equipment can be detrimental to the milk production of dairy cows. However, studies on the effects of noise and vibration produced by high-speed rail trains passing by are to our knowledge never been executed.

Some characteristics of an electrified high-speed rail line that are supporting the idea that the influence/impact on the milk production of dairy cows is neglectable, are the following:

- When building a high-speed railway line, the optimum track alignment and landscape integration is sought. This means that the HSR corridor is mostly situated nearby highways and other existing linear infrastructures in order to minimize the visible and auditive impact in the environment. Using ecoducts and custom-made under- and overpasses especially built for farming equipment the integration into the environment can be optimized;
- When passing through sensitive areas, noise and vibration barriers are built in the systems. These devices (green walls, mass spring systems, long welded rails, sub-ballast mats, etc.) strongly diminishes the nuisance to men and livestock.
- When it comes to noise nuisance, it is important to mention that continuous monotonic sounds (cfr. highways) are more uncomfortable/detrimental to living organisms than frequently generated moments of noise. These sound peaks produced by passing high-speed trains are even a lot quieter than the noise produced by the highways and the conventional trains.

*Cars & trucks
nuisance vs.
trains vs
shorter routes*

h) Effects of noise and vibrations of high-speed trains on breeding patterns of livestock:

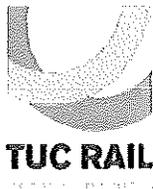
After more than 175 years of railway experience and 14 years of high-speed trains running trough the agricultural areas of Belgium, no significant effects on the breeding patterns of livestock living nearby these HSR infrastructures were recorded.

i) Solutions for high-speed train systems built diagonally through farm lands, making certain parcels inaccessible or less efficient to farm:

TUC RAIL has encountered these situations several times when designing the Belgian high-speed railway network and has created some custom-made solutions for each one of them: ecoducts, special under- and overpasses for farming equipment, cut-and-cover tunnels... Just as for the other above-mentioned points such as the width of the track, TUC RAIL will be more than willing to work as an engineering company on the California High-Speed Rail Project and is looking forward to providing the most appropriate and reliable engineering solutions for these problems/concerns.

*negotiated
solution*





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3) Attendance of TUC RAIL expert during informational hearings

TUC RAIL's experts are available for attending informational hearings in California during the second half of February and early March 2011. However, for these attendances TUC RAIL is forced to charge a small fee and to have the travel and lodging expenses of its experts reimbursed at cost. On simple demand TUC RAIL can make a proposal (resume of the proposed expert and fee) based upon the proposed dates and the availability of the experts.

In addition to the information provided above, please find in attachment a general presentation on high speed rail and the environment.

Hoping to have provided you with some clarifying answers, we remain at your disposal for further information.

Yours sincerely,



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Key Account Manager

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