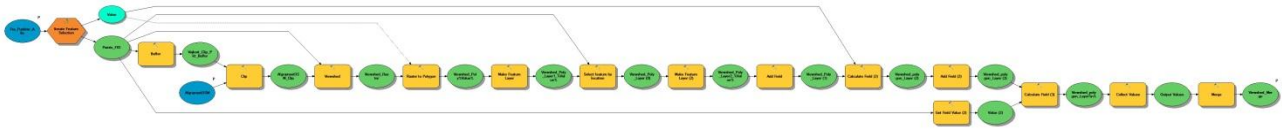


CalcView



Figur 1 : CalcView i modelbuilder

```
# CalcView.py
# Created on: 2012-03-28 13:52:25.00000
# (generated by ArcGIS/ModelBuilder)
# Usage: CalcView <IdPunkt_Table_Merge>
# Description:
# -----

# Set the necessary product code
import arceditor

# Import arcpy module
import arcpy

# Check out any necessary licenses
arcpy.CheckOutExtension("spatial")

# Load required toolboxes
arcpy.ImportToolbox("Model Functions")

# Script arguments
IdPunkt_Table_Merge = arcpy.GetParameterAsText(0)
if IdPunkt_Table_Merge == '#' or not IdPunkt_Table_Merge:
    IdPunkt_Table_Merge = "C:\\Users\\Vufido\\Documents\\Afgangsprojekt\\Final
GIS\\Geodatabase.gdb\\IdPunkt_Table_Merge" # provide a default value if unspecified

# Local variables:
IdPunkt_Work = "IdPunkt_Work"
IdPunkt = "Rdy_Input\\IdPunkt"
Vejmidte_Vej = "C:\\Users\\Vufido\\Documents\\Afgangsprojekt\\Final GIS\\Geodatabase.gdb\\Vejmidte_Vej"
mosaic_shift = "C:\\Users\\Vufido\\Documents\\Afgangsprojekt\\Final GIS\\Geodatabase.gdb\\mosaic_shift"
Vejmidte_Net = "Rdy_Input\\Vejnet\\Vejmidte_Net"
I_IdPunkt_Work = "I_IdPunkt_Work"
Viewshed_Buffer = "C:\\Users\\Vufido\\Documents\\Afgangsprojekt\\Final
GIS\\Geodatabase.gdb\\Viewshed_Buffer"
mosaic_Clip = "C:\\Users\\Vufido\\Documents\\Afgangsprojekt\\Final GIS\\Geodatabase.gdb\\Mosaic_Edit_Clip"
Viewshe_R = "C:\\Users\\Vufido\\Documents\\Afgangsprojekt\\Final GIS\\Geodatabase.gdb\\Viewshe_R"
Viewshed_P = "C:\\Users\\Vufido\\Documents\\Afgangsprojekt\\Final GIS\\Geodatabase.gdb\\Viewshed_P"
Output_Layer = "Viewshed_P_Layer"
Id_Punkt_Intersect = "C:\\Users\\Vufido\\Documents\\Afgangsprojekt\\Final
GIS\\Geodatabase.gdb\\Id_Punkt_Intersect"
Id_Punkt_Intersect__2_ = "C:\\Users\\Vufido\\Documents\\Afgangsprojekt\\Final
GIS\\Geodatabase.gdb\\Id_Punkt_Intersect"
```

Bilag

CalcView

```
IdPunkt_2Pkt__Value_ = "C:\\Users\\Vufido\\Documents\\Afgangsprojekt\\Final
GIS\\Geodatabase.gdb\\IdPunkt_2Pkt_%Value%"
IdPunkt_2Pkt__Value__4_ = "C:\\Users\\Vufido\\Documents\\Afgangsprojekt\\Final
GIS\\Geodatabase.gdb\\IdPunkt_2Pkt_%Value%"
Value = "1"
Output_Values = "C:\\Users\\Vufido\\Documents\\Afgangsprojekt\\Final GIS\\Geodatabase.gdb\\IdPunkt_2Pkt_1"
Output_Layer_Name = "Rdy_Input\\IdPunkt"

# Process: Iterate Feature Selection
arcpy.IterateFeatureSelection_mb(IdPunkt_Work, "", "false")

# Process: Buffer
arcpy.Buffer_analysis(I_IdPunkt_Work, Viewshed_Buffer, "460 Meters", "FULL", "ROUND", "LIST",
"OBJECTID;OFFSETA;OFFSETB;RADIUS2")

# Process: Clip
arcpy.Clip_management(mosaic_shift, "552133,031499999 6319191,54000001 561642,9156 6327000,16430001",
mosaic_Clip, Viewshed_Buffer, "", "NONE")

# Process: Viewshed
arcpy.gp.Viewshed_sa(mosaic_Clip, I_IdPunkt_Work, Viewshe_R, "1", "FLAT_EARTH", "")

# Process: Raster to Polygon
arcpy.RasterToPolygon_conversion(Viewshe_R, Viewshed_P, "SIMPLIFY", "VALUE")

# Process: Make Feature Layer
arcpy.MakeFeatureLayer_management(Viewshed_P, Output_Layer, "", "", "Shape Shape VISIBLE NONE;OBJECTID
OBJECTID VISIBLE NONE;Shape_Length Shape_Length VISIBLE NONE;Shape_Area Shape_Area VISIBLE NONE;ID ID
VISIBLE NONE;GRIDCODE GRIDCODE VISIBLE NONE")

# Process: Select Layer By Location
arcpy.SelectLayerByLocation_management(Output_Layer, "INTERSECT", I_IdPunkt_Work, "", "NEW_SELECTION")

# Process: Intersect
arcpy.Intersect_analysis("Viewshed_P_Layer #;Rdy_Input\\Vejnet\\Vejmidte_Net #", Id_Punkt_Intersect, "ONLY_FID",
"", "POINT")

# Process: Snap
arcpy.Snap_edit(Id_Punkt_Intersect, "C:\\Users\\Vufido\\Documents\\Afgangsprojekt\\Final
GIS\\Geodatabase.gdb\\Vejmidte_Vej' VERTEX '3 Meters")

# Process: Select Layer By Location (2)
arcpy.SelectLayerByLocation_management(IdPunkt, "INTERSECT", Id_Punkt_Intersect__2_, "", "NEW_SELECTION")

# Process: Get Field Value
arcpy.GetFieldValue_mb(I_IdPunkt_Work, "ID", "", "0")

# Process: Copy Features
arcpy.CopyFeatures_management(Output_Layer_Name, IdPunkt_2Pkt__Value_, "", "0", "0", "0")

# Process: Add Field
arcpy.AddField_management(IdPunkt_2Pkt__Value_, "ID_FROM", "LONG", "", "", "", "", "NULLABLE",
"NON_REQUIRED", "")
```

Bilag

CalcView

Process: Calculate Field

```
arcpy.CalculateField_management(IdPunkt_2Pkt__Value__4_, "ID_FROM", Value, "VB", "")
```

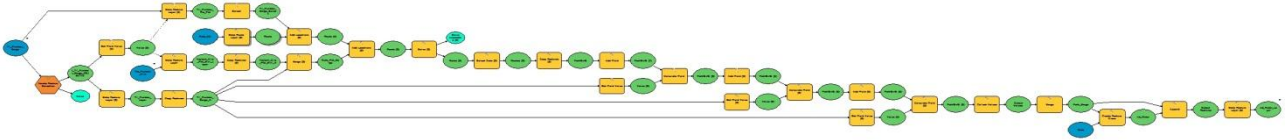
Process: Collect Values

```
arcpy.CollectValues_mb("C:\\Users\\Vufido\\Documents\\Afgangsprojekt\\Final  
GIS\\Geodatabase.gdb\\IdPunkt_2Pkt_%Value%")
```

Process: Merge

```
arcpy.Merge_management(Output_Values, IdPunkt_Table_Merge, "FEAT_ID \"FEAT_ID\" true true false 8 Double 0 0  
,First,#,C:\\Users\\Vufido\\Documents\\Afgangsprojekt\\Final GIS\\Geodatabase.gdb\\IdPunkt_2Pkt_1,FEAT_ID,-1,-  
1;FOTFEAT_ID \"FOTFEAT_ID\" true true false 8 Double 0 0  
,First,#,C:\\Users\\Vufido\\Documents\\Afgangsprojekt\\Final GIS\\Geodatabase.gdb\\IdPunkt_2Pkt_1,FOTFEAT_ID,-  
1,-1;ID \"ID\" true true false 4 Long 0 0 ,First,#,C:\\Users\\Vufido\\Documents\\Afgangsprojekt\\Final  
GIS\\Geodatabase.gdb\\IdPunkt_2Pkt_1,ID,-1,-1;OFFSETA \"OFFSETA\" true true false 4 Long 0 0  
,First,#,C:\\Users\\Vufido\\Documents\\Afgangsprojekt\\Final GIS\\Geodatabase.gdb\\IdPunkt_2Pkt_1,OFFSETA,-1,-  
1;OFFSETB \"OFFSETB\" true true false 8 Double 0 0 ,First,#,C:\\Users\\Vufido\\Documents\\Afgangsprojekt\\Final  
GIS\\Geodatabase.gdb\\IdPunkt_2Pkt_1,OFFSETB,-1,-1;RADIUS2 \"RADIUS2\" true true false 4 Long 0 0  
,First,#,C:\\Users\\Vufido\\Documents\\Afgangsprojekt\\Final GIS\\Geodatabase.gdb\\IdPunkt_2Pkt_1,RADIUS2,-1,-  
1;ID_FROM \"ID_FROM\" true true false 0 Long 0 0 ,First,#,C:\\Users\\Vufido\\Documents\\Afgangsprojekt\\Final  
GIS\\Geodatabase.gdb\\IdPunkt_2Pkt_1,ID_FROM,-1,-1")
```

CalcRoute



Figur 2 : CalcRoute i modelbuilder

```
# -----  
# CalcRoute.py  
# Created on: 2012-03-28 13:52:49.00000  
# (generated by ArcGIS/ModelBuilder)  
# Usage: CalcRoute <IdPunkt_Table_Merge> <IdPunkt_Work> <Path_Merge__2_>  
# Description:  
# -----  
  
# Import arcpy module  
import arcpy  
  
# Check out any necessary licenses  
arcpy.CheckOutExtension("Network")  
  
# Load required toolboxes  
arcpy.ImportToolbox("Model Functions")  
  
# Script arguments  
IdPunkt_Table_Merge = arcpy.GetParameterAsText(0)  
if IdPunkt_Table_Merge == '#' or not IdPunkt_Table_Merge:  
    IdPunkt_Table_Merge = "C:\\Users\\Vufido\\Documents\\Afgangsprojekt\\Final  
GIS\\Geodatabase.gdb\\IdPunkt_Table_Merge" # provide a default value if unspecified  
  
IdPunkt_Work = arcpy.GetParameterAsText(1)  
if IdPunkt_Work == '#' or not IdPunkt_Work:  
    IdPunkt_Work = "C:\\Users\\Vufido\\Documents\\Afgangsprojekt\\Final GIS\\Geodatabase.gdb\\IdPunkt_Work" #  
provide a default value if unspecified  
  
Path_Merge__2_ = arcpy.GetParameterAsText(2)  
if Path_Merge__2_ == '#' or not Path_Merge__2_:  
    Path_Merge__2_ = "C:\\Users\\Vufido\\Documents\\Afgangsprojekt\\Final GIS\\Geodatabase.gdb\\Path_Merge" #  
provide a default value if unspecified  
  
# Local variables:  
Vejnet_ND = "C:\\Users\\Vufido\\Documents\\Afgangsprojekt\\Final GIS\\Geodatabase.gdb\\Vejnet\\Vejnet_ND"  
I_Clip_Vejkort_Dangles_Merge_OBJECTID = IdPunkt_Table_Merge  
Value__2_ = I_Clip_Vejkort_Dangles_Merge_OBJECTID  
IdPunkt_Work_Layer = Value__2_  
Vejkort_Clip_Pkt_Merge_shp = IdPunkt_Work_Layer  
Rute__4_ = Vejkort_Clip_Pkt_Merge_shp
```

Bilag

CalcRoute

```
Rute__3_ = Rute__4_  
Rute__5_ = Rute__3_  
Routes__2_ = Rute__5_  
Path_shp = Routes__2_  
Path__3_ = Path_shp  
Path__2_ = Path__3_  
Path__4_ = Path__2_  
Solve_succeeded__2_ = Rute__3_  
Value__3_ = IdPunkt_Work_Layer  
Output_Layer__2_ = I_Clip_Vejkort_Dangles_Merge_OBJECTID  
Value__4_ = I_Clip_Vejkort_Dangles_Merge_OBJECTID  
Value = IdPunkt_Table_Merge  
IdPunkt_Table_Merge_Layer2 = IdPunkt_Table_Merge  
Path_Merge = "C:\\Users\\Vufido\\Documents\\Afgangsprojekt\\Final GIS\\Geodatabase.gdb\\Path_Merge"  
Rute = "Rute"  
  
# Process: Make Route Layer (2)  
arcpy.MakeRouteLayer_na(Vejnet_ND, "Rute", "Afstand", "USE_INPUT_ORDER", "PRESERVE_BOTH",  
"NO_TIMEWINDOWS", "", "ALLOW_UTURNS", "", "NO_HIERARCHY", "", "TRUE_LINES_WITH_MEASURES", "")  
  
# Process: Iterate Feature Selection  
arcpy.IterateFeatureSelection_mb(IdPunkt_Table_Merge, "OBJECTID #", "false")  
  
# Process: Get Field Value  
arcpy.GetFieldValue_mb(I_Clip_Vejkort_Dangles_Merge_OBJECTID, "ID_FROM", "", "0")  
  
# Process: Make Feature Layer  
arcpy.MakeFeatureLayer_management(IdPunkt_Work, IdPunkt_Work_Layer, "\"ID\" =%Value (2)%", "", "OBJECTID  
OBJECTID VISIBLE NONE;Shape Shape VISIBLE NONE;FEAT_ID FEAT_ID VISIBLE NONE;FOTFEAT_ID FOTFEAT_ID VISIBLE  
NONE;ID ID VISIBLE NONE;OFFSETA OFFSETA VISIBLE NONE;OFFSETB OFFSETB VISIBLE NONE;RADIUS2 RADIUS2  
VISIBLE NONE")  
  
# Process: Get Field Value (3)  
arcpy.GetFieldValue_mb(I_Clip_Vejkort_Dangles_Merge_OBJECTID, "ID", "", "0")  
  
# Process: Make Feature Layer (3)  
arcpy.MakeFeatureLayer_management(I_Clip_Vejkort_Dangles_Merge_OBJECTID, Output_Layer__2_, "", "",  
"OBJECTID OBJECTID VISIBLE NONE;Shape Shape VISIBLE NONE;FEAT_ID FEAT_ID VISIBLE NONE;FOTFEAT_ID  
FOTFEAT_ID VISIBLE NONE;ID ID VISIBLE NONE;OFFSETA OFFSETA VISIBLE NONE;OFFSETB OFFSETB VISIBLE  
NONE;RADIUS2 RADIUS2 VISIBLE NONE;ID_FROM ID_FROM VISIBLE NONE")  
  
# Process: Merge  
arcpy.Merge_management("IdPunkt_Work_Layer;IdPunkt_Table_Merge_Layer", Vejkort_Clip_Pkt_Merge_shp,  
"FEAT_ID \"FEAT_ID\" true true false 8 Double 0 0 ,First,#,IdPunkt_Work_Layer,FEAT_ID,-1,-  
1,IdPunkt_Table_Merge_Layer,FEAT_ID,-1,-1;FOTFEAT_ID \"FOTFEAT_ID\" true true false 8 Double 0 0  
,First,#,IdPunkt_Work_Layer,FOTFEAT_ID,-1,-1,IdPunkt_Table_Merge_Layer,FOTFEAT_ID,-1,-1;ID \"ID\" true true false  
4 Long 0 0 ,First,#,IdPunkt_Work_Layer,ID,-1,-1,IdPunkt_Table_Merge_Layer,ID,-1,-1;OFFSETA \"OFFSETA\" true true  
false 4 Long 0 0 ,First,#,IdPunkt_Work_Layer,OFFSETA,-1,-1,IdPunkt_Table_Merge_Layer,OFFSETA,-1,-1;OFFSETB  
\"OFFSETB\" true true false 8 Double 0 0 ,First,#,IdPunkt_Work_Layer,OFFSETB,-1,-  
1,IdPunkt_Table_Merge_Layer,OFFSETB,-1,-1;RADIUS2 \"RADIUS2\" true true false 4 Long 0 0  
,First,#,IdPunkt_Work_Layer,RADIUS2,-1,-1,IdPunkt_Table_Merge_Layer,RADIUS2,-1,-1;ID_FROM \"ID_FROM\" true  
true false 4 Long 0 0 ,First,#,IdPunkt_Table_Merge_Layer,ID_FROM,-1,-1")  
  
# Process: Add Locations (3)
```

Bilag

CalcRoute

```
arcpy.AddLocations_na(Rute, "Stops", Vejkort_Clip_Pkt_Merge_shp, "Name ID #;RouteName # #;TimeWindowStart # #;TimeWindowEnd # #;CurbApproach # 0;Attr_DriveTime # 0;Attr_Meters # 0;Attr_PedestrianTime # 0;Attr_Afstand # 0", "5000 Meters", "", "Vejnet_ND_Junctions NONE;Vejmidte_Net SHAPE", "MATCH_TO_CLOSEST", "CLEAR", "SNAP", "5 Meters", "INCLUDE", "Vejnet_ND_Junctions #;Vejmidte_Net #")
```

```
# Process: Make Feature Layer (4)
```

```
arcpy.MakeFeatureLayer_management(IdPunkt_Table_Merge, IdPunkt_Table_Merge_Layer2, "\"ID_FROM\" = %Value (2)% AND \"ID\" <> %Value (4)% AND \"ID\" <> %Value (2)%", "", "OBJECTID OBJECTID VISIBLE NONE;Shape Shape VISIBLE NONE;FEAT_ID FEAT_ID VISIBLE NONE;FOTFEAT_ID FOTFEAT_ID VISIBLE NONE;ID ID VISIBLE NONE;OFFSETA OFFSETA VISIBLE NONE;OFFSETB OFFSETB VISIBLE NONE;RADIUS2 RADIUS2 VISIBLE NONE;ID_FROM ID_FROM VISIBLE NONE")
```

```
# Process: Add Locations
```

```
arcpy.AddLocations_na(Rute__4_, "Point Barriers", IdPunkt_Table_Merge_Layer2, "Name # #;CurbApproach # 0;FullEdge # 0;BarrierType # 0;Attr_Afstand # 0", "5000 Meters", "", "Vejnet_ND_Junctions NONE;Vejmidte_Net SHAPE", "MATCH_TO_CLOSEST", "CLEAR", "SNAP", "5 Meters", "INCLUDE", "Vejnet_ND_Junctions #;Vejmidte_Net #")
```

```
# Process: Solve (2)
```

```
arcpy.Solve_na(Rute__3_, "SKIP", "CONTINUE")
```

```
# Process: Get Field Value (2)
```

```
arcpy.GetFieldValue_mb(IdPunkt_Work_Layer, "ID", "String", "0")
```

```
# Process: Select Data (2)
```

```
arcpy.SelectData_management(Rute__5_, "Routes")
```

```
# Process: Copy Features (2)
```

```
arcpy.CopyFeatures_management(Routes__2_, Path_shp, "", "0", "0", "0")
```

```
# Process: Calculate Field
```

```
arcpy.CalculateField_management(Path_shp, "Name", Value__2_, "VB", "")
```

```
# Process: Add Field
```

```
arcpy.AddField_management(Path__3_, "To", "LONG", "", "", "", "", "NON_NULLABLE", "NON_REQUIRED", "")
```

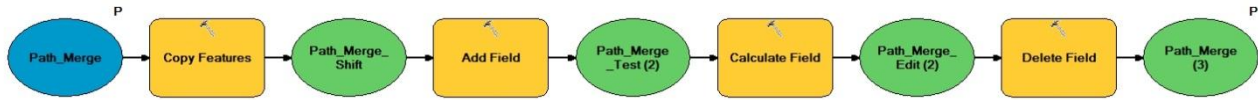
```
# Process: Calculate Field (2)
```

```
arcpy.CalculateField_management(Path__2_, "To", Value__4_, "VB", "")
```

```
# Process: Append
```

```
arcpy.Append_management("C:\\Users\\Vufido\\Documents\\Afgangsprojekt\\Final GIS\\Rutebereg\\Path.shp", Path_Merge, "TEST", "", "")
```

CalcSpeed



Figur 3 : CalcSpeed i modelbuilder

```

# -----
# CalcSpeed.py
# Created on: 2012-03-28 13:53:17.00000
# (generated by ArcGIS/ModelBuilder)
# Usage: CalcSpeed <Path_Merge> <Path_Merge__3_>
# Description:
# -----

# Import arcpy module
import arcpy

# Script arguments
Path_Merge = arcpy.GetParameterAsText(0)
if Path_Merge == '#' or not Path_Merge:
    Path_Merge = "C:\\Users\\Vufido\\Documents\\Afgangsprojekt\\Final GIS\\Geodatabase.gdb\\Path_Merge" #
provide a default value if unspecified

Path_Merge__3_ = arcpy.GetParameterAsText(1)
if Path_Merge__3_ == '#' or not Path_Merge__3_:
    Path_Merge__3_ = "C:\\Users\\Vufido\\Documents\\Afgangsprojekt\\Final
GIS\\Geodatabase.gdb\\Path_Merge_Shift" # provide a default value if unspecified

# Local variables:
Path_Merge_Shift = Path_Merge
Path_Merge_Test__2_ = Path_Merge_Shift
Path_Merge_Edit__2_ = Path_Merge_Test__2_

# Process: Copy Features
arcpy.CopyFeatures_management(Path_Merge, Path_Merge_Shift, "", "0", "0", "0")

# Process: Add Field
arcpy.AddField_management(Path_Merge_Shift, "SafeSpeed_km_t", "LONG", "", "", "", "", "NULLABLE",
"NON_REQUIRED", "")

# Process: Calculate Field
arcpy.CalculateField_management(Path_Merge_Test__2_, "SafeSpeed_km_t",
"(1032993*((62500*[Shape_Length])/1032993 + 625/1296)^(1/2))/31250 - 214777/5000", "VB", "")

# Process: Delete Field
arcpy.DeleteField_management(Path_Merge_Edit__2_, "FirstStop;LastStopID;StopCount;Total_Afst")
  
```

Bilag

Hastighed_begge

Hastighed_begge

```
clc
close all
clear all

%%%%%%%%%%%%%
% Beregner hastighed jf. Forudsætninger for geometrisk udformning.
%%%%%%%%%%%%%
% Definere symbolske værdier
syms V positive
syms Tr Lr Lb Ls Vplus g Ub s

% Opsætter formel for standselængde
F=Lr+Lb-Ls; %..... Forudsætninger for geometrisk udformning, formel 6.3.1

% Opsætter formel for reaktionslængde og bremselængde
Lr=((V+Vplus)*Tr)/3.6; %..... Forudsætninger for geometrisk udformning, formel 6.3.1
Lb=(V+Vplus)^2/(2*g*(Ub+s)*3.6^2); %..... Forudsætninger for geometrisk udformning, formel 6.3.1

% Definerer konstanter
Tr=2.5; %..... Reaktionslid [s]
Vplus=20; %..... Sikkerhedstillæg [km/t]
g=9.81; %..... Tyndgeacceleration [m/s^2]
Ub=0.31; %..... Bremsfriktionskoefficient (Forudsætninger for geometrisk
udformning, figur 6.1)
s=-0.05; %..... Vejstrækningens længdegradient (lige vej antages)

% Omskriver formel for standselængde og isolere indgangshastigheden
Lr=subs(Lr); %..... Værdier substitueres
Lb=subs(Lb); %..... Værdier substitueres
Ls=subs(Ls); %..... Værdier substitueres
F=solve(subs(F),V); %..... Omskrivning: V(Ls) istedet for Ls(V)

%%%%%%%%%%%%%
% Beregner hastighed jf. Detailforskrifter for køretøjer.
%%%%%%%%%%%%%
% Definere symbolske værdier
syms Acc
syms A_koer A_start t V_ind V_stop V_ud A_stop positive

% Opsætter formel for kørt afstand med uændret fart
A_koer=A_start+V_ind*t; % ..... Physics for Scientist and Engineers 7E, formel 2.7

% Definere konstanter
t=2.5; %..... Reaktionsliden sættes til 2.5 sek.
A_start=0; %..... Startposition sættes
```


Bilag

Hastighed_begge

```
A_koer=subs(A_koer); %..... Værdier substitueres

% Opsætter formel for hastighed efter acceleration
F1=V_ind^2+2*Acc*(A_stop-A_koer)-V_stop^2; %..... Physics for Scientist and Engineers 7E, formel 2.17
V_stop=0; %..... Udgangshastigheden sættes til 0 m/s.
Acc=-5.8; %..... Accelerationen sættes til -5.8 m/s^2.

% Omskriver formel så hastigheden udtrykkes ved standselængden
F1=subs(F1); %..... Værdier substitueres
V_ind_ms=solve(F1,V_ind); %..... Indgangshastigheden V_ind [m/s] isoleres
V_ind_kmt=((60*60)/1000)*V_ind_ms; %..... V_ind omregnes til [km/t]
V_stop_kmt=subs(V_ind_kmt);

%%%%%%%%%%%%
% Spørger om input og udskriver resultater
%%%%%%%%%%%%
Ls = input('Indtast synslængde langs vejen i meter = '); A_stop=Ls;
disp('-----');
disp('Sikker hastighed jf. : ');
disp(['-Forudsætninger for geometrisk udformning. = ',int2str(subs(F,Ls)), ' km/t']);
disp(['-Detailforskrifter for køretøjer. = ',int2str(subs(V_stop_kmt)), ' km/t']);
```

Bilag

Hastighed_begge