```
llon1 = 1 / (5);
lloff1 = 1 / (5);
desvio1 = 0;

llon2 = 1 / (5);
lloff2 = 1 / (5);
desvio2 = 0;

maxTSU = 20;

distONs[llon_] :=
  If[t < 0, 0, Integrate[PDF[UniformDistribution[{0, (1 / llon)}], y],
     {y, t, +∞}, Assumptions → t ∈ Reals] /
    Integrate[Integrate[PDF[UniformDistribution[{0, (1 / llon)}], y],
      {y, tt, +∞}, Assumptions → tt ∈ Reals], {tt, 0, +∞}]];

Plot[distONs[llon1], {t, -1, maxTSU}, Filling → Axis, PlotRange → All]
distONs1Sum = N[Integrate[distONs[llon1], {t, 0, +∞}]]
distONs1Avg = N[Integrate[distONs[llon1] * t, {t, 0, +∞}]]

(*Plot[distONs[llon2],{t,-1,maxTSU},Filling→Axis,PlotRange→All]
  distONs2Sum=N[Integrate[distONs[llon2],{t,0,+∞}]]
distONs2Avg=N[Integrate[distONs[llon2]*t,{t,0,+∞}]]*)

distOFFs1[delta_, llon_, lloff_] :=
  Integrate[Integrate[PDF[UniformDistribution[{0 + delta, (1 / llon) + delta}], y] *
      PDF[UniformDistribution[{0, (1 / lloff)}], x], {x, t1 - y, ∞},
     Assumptions → (t1 - y) ∈ Reals], {y, 0, t1}, Assumptions → t1 ∈ Reals] /
   Integrate[Integrate[PDF[UniformDistribution[{0, (1 / lloff)}], y],
     {y, tt, +∞}, Assumptions → tt ∈ Reals], {tt, 0, +∞}];
distOFFs2[delta_, llon_, lloff_] := Integrate[
    Integrate[PDF[UniformDistribution[{0 + delta, (1 / llon) + delta}], y] *
      PDF[UniformDistribution[{0, (1 / lloff)}], x], {x, t2 - y, ∞},
     Assumptions → (t2 - y) ∈ Reals], {y, 0, t2}, Assumptions → t2 ∈ Reals] /
   Integrate[Integrate[PDF[UniformDistribution[{0, (1 / lloff)}], y],
     {y, tt, +∞}, Assumptions → tt ∈ Reals], {tt, 0, +∞}];

Plot[distOFFs1[0, llon1, lloff1], {t1, 0, maxTSU}, Filling → Axis, PlotRange → All]
distOFFs1Sum = N[Integrate[distOFFs1[0, llon1, lloff1], {t1, -∞, +∞}]]
distOFFs1Avg = N[Integrate[distOFFs1[0, llon1, lloff1] * t1, {t1, -∞, +∞}]]

Plot[distOFFs2[0, llon2, lloff2], {t2, 0, maxTSU}, Filling → Axis, PlotRange → All]
distOFFs2Sum = N[Integrate[distOFFs2[0, llon2, lloff2], {t2, 0, +∞}]]
distOFFs2Avg = N[Integrate[distOFFs2[0, llon2, lloff2] * t2, {t2, 0, +∞}]]

f1[llon_, lloff_, desvio_] := Convolve[PDF[UniformDistribution[{0, 1 / llon}], tt],
   PDF[UniformDistribution[{0, 1 / lloff}], tt], tt, k1];
f2[llon_, lloff_, desvio_] := Convolve[PDF[UniformDistribution[{0, 1 / llon}], tt],
   PDF[UniformDistribution[{0, 1 / lloff}], tt], tt, k2];

Avail1 = Table[N[f1[llon1, lloff1, desvio1]], {k1, 0, maxTSU}];
Plot[f1[llon1, lloff1, desvio1], {k1, 0, maxTSU}, Filling → Axis, PlotRange → All]
Avail1Sum = N[Integrate[f1[llon1, lloff1, desvio1], {k1, 0, +∞}]]
Avail1Avg = N[Integrate[f1[llon1, lloff1, desvio1] * k1, {k1, 0, +∞}]]

Avail2 = Table[N[f2[llon2, lloff2, desvio2]], {k2, 1, maxTSU}];
Plot[f2[llon2, lloff2, desvio2], {k2, 0, maxTSU}, Filling → Axis, PlotRange → All]
Avail2Sum = N[Integrate[f2[llon2, lloff2, desvio2], {k2, 0, +∞}]]
Avail2Avg = N[Integrate[f2[llon2, lloff2, desvio2] * k2, {k2, 0, +∞}]]
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(*dn=1;
JointAvEq=Integrate[f2[llon2,lloff2,desvio2]*
    Integrate[f1[llon1,lloff1,desvio1],{k1,m,m+dn},Assumptions→m∈Reals],
  {k2,n,n+dn},Assumptions→n∈Reals];
DiscretePlot3D[JointAvEq,{m,0,maxTSU,dn},{n,0,maxTSU,dn},
    Joined→False,Filling→Axis,PlotRange→All,ColorFunction→"Rainbow"]
  JointAvEqSum=N[Sum[JointAvEq,{m,0,maxTSU,dn},{n,0,maxTSU,dn}]]*)

dn = 1;
JointOFFs =
  Integrate[Integrate[distOFFs1[0, llon1, lloff1] * distOFFs2[0, llon2, lloff2],
    {t1, m, m + dn}, Assumptions → m ∈ Reals],
   {t2, n, n + dn}, Assumptions → n ∈ Reals];
DiscretePlot3D[JointOFFs, {m, 0, maxTSU, dn}, {n, 0, maxTSU, dn},
 Joined → False, Filling → Axis, PlotRange → All, ColorFunction → "Rainbow"]
JointOFFsSum = N[Sum[JointOFFs, {m, 0, maxTSU, dn}, {n, 0, maxTSU, dn}]]

Opp = Convolve[distOFFs1[0, llon1, lloff1] /. t1 → -t,
   distOFFs2[0, llon2, lloff2] /. t2 → t, t, l];
Plot[Opp, {l, -maxTSU, maxTSU}, Filling → Axis, PlotRange → All]
OppSum = N[Integrate[Opp, {l, -∞, +∞}]]
OppAvg = N[Integrate[Opp * l, {l, -∞, +∞}]]
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llon1 = 1 / (5);
lloff1 = 1 / (5);
desvio1 = 0;

llon2 = 1 / (5);
lloff2 = 1 / (5);
desvio2 = 0;

MinOffs = PDF[UniformDistribution[{0, (1 / lloff1)}], t] +
   PDF[UniformDistribution[{0 + desvio2, (1 / lloff2) + desvio2}], t] -
   (PDF[UniformDistribution[{0, (1 / lloff1)}], t] *
     CDF[UniformDistribution[{0 + desvio2, (1 / lloff2) + desvio2}], t]) -
   (CDF[UniformDistribution[{0, (1 / lloff1)}], t] *
     PDF[UniformDistribution[{0 + desvio2, (1 / lloff2) + desvio2}], t]);

MinOffsAvg = N[Integrate[MinOffs * t, {t, 0, +∞}]]
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```
llon1 = 1 / (5);
lloff1 = 1 / (5);
desvio1 = 0;

llon2 = 1 / (5);
lloff2 = 1 / (5);
desvio2 = 0;

f1[llon_, lloff_, desvio_] :=
  Convolve[PDF[UniformDistribution[{0 + desvio, (1 / llon) + desvio}], tt],
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    PDF[UniformDistribution[{0, 1 / lloff}], tt], tt, x];
f2[llon_, lloff_, desvio_] := Convolve[
    PDF[UniformDistribution[{0 + desvio, (1 / llon) + desvio}], tt],
    PDF[UniformDistribution[{0, 1 / lloff}], tt], tt, x];

(*Plot[f1[llon1,lloff1,desvio1],{x,0,20}]
 Plot[f2[llon2,lloff2,desvio2],{x,0,20}]*)

minsavs =
   (f1[llon1, lloff1, desvio1] /. x → xx) + (f2[llon2, lloff2, desvio2] /. x → xx) -
    ((f1[llon1, lloff1, desvio1] /. x → xx) * Integrate[
       f2[llon2, lloff2, desvio2], {x, -∞, xx}, Assumptions -> xx ∈ Reals]) -
    (Integrate[f1[llon1, lloff1, desvio1], {x, -∞, xx}, Assumptions -> xx ∈ Reals] *
      (f2[llon2, lloff2, desvio2] /. x → xx));
Plot[minsavs, {xx, 0, 13}, Filling → Axis, PlotRange → All]
NIntegrate[minsavs * xx, {xx, -∞, +∞}]

(*Plot[PDF[UniformDistribution[{0+desvio1,(1/llon1)+desvio1}],xx],{xx,0,15}]
 Plot[PDF[UniformDistribution[{0+desvio2,(1/llon2)+desvio2}],xx],{xx,0,15}]*)

maxons = PDF[UniformDistribution[{0 + desvio1, (1 / llon1) + desvio1}], xx] *
     CDF[UniformDistribution[{0 + desvio2, (1 / llon2) + desvio2}], xx] +
    CDF[UniformDistribution[{0 + desvio1, (1 / llon1) + desvio1}], xx] *
     PDF[UniformDistribution[{0 + desvio2, (1 / llon2) + desvio2}], xx];
Plot[maxons, {xx, -1, 10}, Filling → Axis, PlotRange → All]
NIntegrate[maxons * xx, {xx, -∞, +∞}]

degrau[xx_, desvio_] := If[xx ≤ desvio, 0, 1];
degrau2[xx_, llon_, desvio_] := If[desvio ≤ xx ≤ (1 / llon) + desvio, 1, 0];
degrau3[xx_] := If[xx ≤ 0, 1, 0];

duracao = Convolve[maxons, minsavs /. xx → -xx, xx, x];
Plot[duracao, {x, -15, 15}, Filling → Axis, PlotRange → All]
NIntegrate[duracao, {x, -∞, +∞}]
NIntegrate[duracao * x, {x, -∞, +∞}]

duracao = degrau[x, desvio2] * Convolve[maxons, minsavs /. xx → -xx, xx, x];
duracaonorm = duracao / Integrate[duracao, {x, -∞, +∞}];
Plot[duracaonorm, {x, -15, 15}, Filling → Axis, PlotRange → All]
NIntegrate[duracaonorm, {x, -∞, +∞}]
NIntegrate[duracaonorm * (x - desvio2), {x, -∞, +∞}]

duracao = degrau2[x, llon2, desvio2] * Convolve[maxons, minsavs /. xx → -xx, xx, x];
duracaonorm = duracao / Integrate[duracao, {x, -∞, +∞}];
Plot[duracaonorm, {x, -15, 15}, Filling → Axis, PlotRange → All]
NIntegrate[duracaonorm, {x, -∞, +∞}]
NIntegrate[duracaonorm * (x), {x, -∞, +∞}]

duracao = degrau3[x] * Convolve[maxons, minsavs /. xx → -xx, xx, x];
duracaonorm = duracao / Integrate[duracao, {x, -∞, +∞}];
Plot[duracaonorm, {x, -15, 15}, Filling → Axis, PlotRange → All]
NIntegrate[duracaonorm, {x, -∞, +∞}]
NIntegrate[duracaonorm * (x), {x, -∞, +∞}]
```

```
llon1 = 1 / (5);
lloff1 = 1 / (5);
desvio1 = 0;

llon2 = 1 / (5);
lloff2 = 1 / (5);
desvio2 = 0;

f1[llon_, lloff_, desvio_] :=
  Convolve[PDF[UniformDistribution[{0 + desvio, (1 / llon) + desvio}], tt],
   PDF[UniformDistribution[{0, 1 / lloff}], tt], tt, x];
f2[llon_, lloff_, desvio_] := Convolve[
   PDF[UniformDistribution[{0 + desvio, (1 / llon) + desvio}], tt],
   PDF[UniformDistribution[{0, 1 / lloff}], tt], tt, x];

ProbComm1 = NIntegrate[Convolve[
    PDF[UniformDistribution[{0 + desvio2, (1 / llon2) + desvio2}], x] /. x → -x,
    f1[llon1, lloff1, desvio1], x, l], {l, -∞, 0}];
ProbComm2 = NIntegrate[Convolve[
    PDF[UniformDistribution[{0 + desvio1, (1 / llon1) + desvio1}], x] /. x → -x,
    f2[llon2, lloff2, desvio2], x, l], {l, -∞, 0}];

ProbComm = N[1 - ProbComm1 - ProbComm2]
```